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PUBLICATION 609

ISSUED MARCH, 1938

TECHNICAL BULLETIN NO. 15

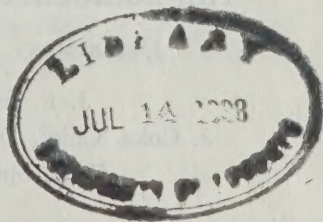
FIRST PRINTING

DOMINION OF CANADA—DEPARTMENT OF AGRICULTURE

3 1761 12000846 1

Physical and Economic Factors Related to Land Use Classification in Southwest Central Saskatchewan

DEPARTMENT OF FARM MANAGEMENT
UNIVERSITY OF SASKATCHEWAN
CO-OPERATING WITH
THE AGRICULTURAL ECONOMICS BRANCH
DOMINION DEPARTMENT OF AGRICULTURE



Published by authority of the Hon. James G. Gardiner, Minister of Agriculture,
Ottawa, 1938

THE SASKATCHEWAN AGRICULTURAL RESEARCH FOUNDATION

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FOREWORD

THE economic use of land in Saskatchewan presents a problem which has been intensified by drought conditions during the past six years. This preliminary report presents economic information relating to the different soil types within the area surveyed. The project is one of a series to determine a classification of farm lands more particularly in those sections of the province affected by drought. These studies form a part of the program of rehabilitation initiated in 1935.

In order to carry these studies forward to completion as rapidly as possible, the Economics Branch of the Dominion Department of Agriculture joined with the Department of Farm Management, University of Saskatchewan. Both agencies are indebted to the Saskatchewan Agricultural Research Foundation and the Prairie Farm Rehabilitation Committee for the larger share of the funds with which the study is being carried on and without which the scope of the work would be limited.

TABLE OF CONTENTS

	PAGE
Introduction.....	5
Summary.....	5
Area and Reason for Its Selection.....	6
Settlement of Area.....	7
Number of Farms included in the Survey.....	8
Birthplace of the People.....	8
Climate.....	9
General Description of Climate.....	9
Precipitation and Temperature Related to Yield of Wheat, Rural Municipalities of Chaplin and Shamrock.....	10
Variability in Yields.....	13
Topography.....	13
Soil.....	14
Factors to be Considered in a Land Use Study.....	15
Soils Graded on Productivity.....	16
Relationship of the Topography of the Land to Productivity.....	17
Wheat Yields of the Area.....	18
Municipal Averages and Averages of Estimates of Wheat Yields Provided by Farmers Co-operating in Survey.....	18
Wheat Yields by Topography and Soil.....	18
Wheat Yields as a Basis of Comparison for Three Soil Groups in Each Topography Class.....	20
Population.....	22
Changes in Population Numbers.....	22
Relation of Soils to Population Density.....	23
Land Tenure.....	24
Relation of Topography and Soil to Land Tenure.....	24
Use of Land.....	24
Size of Farms and Use of Land by Municipalities.....	24
Use of Land by Topography and Soil.....	25
Changes in the Use of Land.....	26
The Growing of Fall Rye.....	28
Live Stock.....	30
Numbers and Classes of Live Stock in the Area Surveyed Compared with Those of the Province.....	30
Relationship of Topography and Soil to Farm Live Stock Enterprises.....	30
Leased Pasture Land.....	31
Changes in Live Stock Population.....	32
Water Facilities.....	33
Sources of Water for Farms on the Various Classes of Topography and Soil.....	33
The Amount and Quality of Water Related to Topography and Soil.....	33
Farm Buildings.....	35
Size of Principal Farm Buildings.....	35
Condition of Principal Farm Buildings.....	35
Vacant and Abandoned Farms.....	37
Vacating and Abandoning of Farms, 1931 to 1935.....	37
Occurrence of Vacant and Abandoned Farms on the Various Classes of Topography and Soil.....	37
Tenure of Last Operator.....	38
Reasons for Vacating and Abandoning Farms.....	38
Present Ownership of Vacant and Abandoned Farms.....	38
Acquisition of Land.....	39
Mode of Acquiring Land.....	39
The Average Price of Purchased Land.....	40
Progress of Farm Owners in Acquiring Land.....	41
Progress of Farm Owners in Paying for Land Purchased.....	42
Farm Indebtedness.....	45
Farm Indebtedness in this Area Compared with Other Parts of the Province.....	46
Farm Indebtedness and Its Relation to Topography and Soil.....	46
Indebtedness of Farm Operators Who do not Rent.....	47
Classification of the Farm Indebtedness.....	48
Mortgage Indebtedness.....	49
Relief Indebtedness.....	49
Relationship of the Size of Family and of the Farm to the Total Relief Debt.....	51

A STUDY OF CERTAIN PHYSICAL AND ECONOMIC FACTORS RELATED TO LAND USE CLASSIFICA- TION IN SOUTHWEST CENTRAL SASKATCHEWAN

INTRODUCTION

In 1935, the first of a series of studies was commenced by the Farm Management Department of the University of Saskatchewan and the Agricultural Economics Branch of the Dominion Department of Agriculture to prepare for an economic classification of Saskatchewan lands based on the physical and financial evidence of progress made by the settlers in the use of the land. In this preliminary report of the first study, an attempt is made to present statistically the physical characteristics of a selected area and the farms within this area, and to describe the past and present use of the land. The latter part of the report deals with the conditions of acquisition of the land and an analysis of their present indebtedness.¹

SUMMARY

The area of the economic survey 1935 comprises seven rural municipalities in southwest central Saskatchewan and is representative of a large part of southern Saskatchewan which has suffered from drought and soil drifting.

In this area for a seventeen-year period 1918 to 1934 an average temperature of the growing season at approximately 62° F. and a maximum at approximately 97° F. appeared to have been the critical points, above which even with conditions normal for precipitation, yields were adversely affected. (Page 12.)

Since early settlement commercial wheat production has been the chief farm enterprise and its importance has tended to increase. In the seven municipalities the acreage devoted to wheat increased from 70 to 78 per cent of the acreage in crops. (Page 28.)

Only on farms where the topography is rolling to steep and on the light loams and fine sandy loam where the topography is less rolling are the numbers of live stock such as to make live-stock enterprises of any commercial significance compared with wheat and such significance is restricted to cattle. (Page 30.)

Eight hundred and thirty-six usable records were obtained from farm operators concerning the history and present status of their farm businesses, and in addition, 240 reports were obtained concerning vacant and abandoned farms. Classified according to the predominant topographical features and soil of the farms, the information obtained on these farms indicates:—

1. Where the topography was level to undulating compared with farms where the topography was more rolling, there were:—

- (a) Larger acreage per farm. (Page 17.)

- (b) Greater percentage of the farm area improved and available for crop production. (Page 17.)

¹ This preliminary report was prepared by W. Allen, Department of Farm Management, University of Saskatchewan, C. C. Spence and G. C. Elliott, Agricultural Economics Branch, Dominion Department of Agriculture, and is subject to revision and correction. Acknowledgment is made of the assistance given in the collection and analysis of data by E. C. Hope, H. Van Vliet, R. Stutt and J. Charnetski, Department of Farm Management, University of Saskatchewan and W. J. Hansen, Agricultural Economics Branch, Dominion Department of Agriculture. The generous co-operation of the farmers included in this survey, the secretaries-treasurer and other officials of the seven municipalities, the Soils Department of the University of Saskatchewan, the Saskatchewan Department of Agriculture and of the Saskatchewan Relief Commission, is greatly appreciated.

- (c) Larger percentage of tenant-operated farms. (Page 24.)
 - (d) Considerably higher investment in farm buildings per farm. (Page 35.)
 - (e) Fewer live stock per farm. (Page 31.)
2. For farms in the same topography class on clays and clay loam soils compared with farms on silt loams and loams and with farms on light loams and fine sandy loam soils there was:—
- (a) Higher average wheat yield per acre for the 15-year period from 1920 to 1934. (Page 21.)
 - (b) Higher investment in farm buildings per farm except where the topography was strongly rolling to steep. (Page 35.)
 - (c) Larger total indebtedness for farm owners per acre of cropland. (Page 47.)
 - (d) Larger percentage of land indebtedness secured by mortgages than by agreement of sale contracts. (Page 50.)
 - (e) Less cropland per acre allowed to remain idle. (Page 26.)
 - (f) A smaller proportion of farms with adequate water facilities except where topography was strongly rolling to steep. (Page 34.)
 - (g) Fewer vacant and/or abandoned farms except where the topography was strongly rolling to steep. (Page 38.)

In this area, the heavier soils (clays and clay loams) support a larger population per square mile than do the lighter ones, and have done so since early settlement. (Page 23.)

The average price paid per acre for land acquired by purchase was considerably higher for farms on heavier soils than those on lighter soils for each five-year period since early settlement. The average purchase price per acre 1930 to 1935 for farms on clays and clay loams was \$16.72, silt loams and loams \$19.60 and for farms on light loams and fine sandy loam soils \$7.81. (Page 41.)

In general by 1935, no net progress in paying for land purchased since 1920 was evident. Considerable amounts had been paid on principal from the time of purchase until 1929, but such payments were offset by the accumulation of unpaid interest since that time. (Page 44.)

In 1935, the average total debt of 529 owner-operators was \$9,697, which was approximately 59 per cent greater than the average total debt of 849 owner-operators co-operating in farm indebtedness studies 1932 to 1934, in four other areas representative of other parts of Saskatchewan. (Page 46.)

For owners and owner-tenants about 19 per cent of total indebtedness was for relief and for tenants about 65 per cent of their total indebtedness. Both size of farm, measured in acres of cropland, and the number of persons living on the farm were contributing factors to the extent of the relief debt, but of these two factors the number of persons who had to be supported on the farms appears to have been the more important. (Page 48.)

Area and Reason for Its Selection

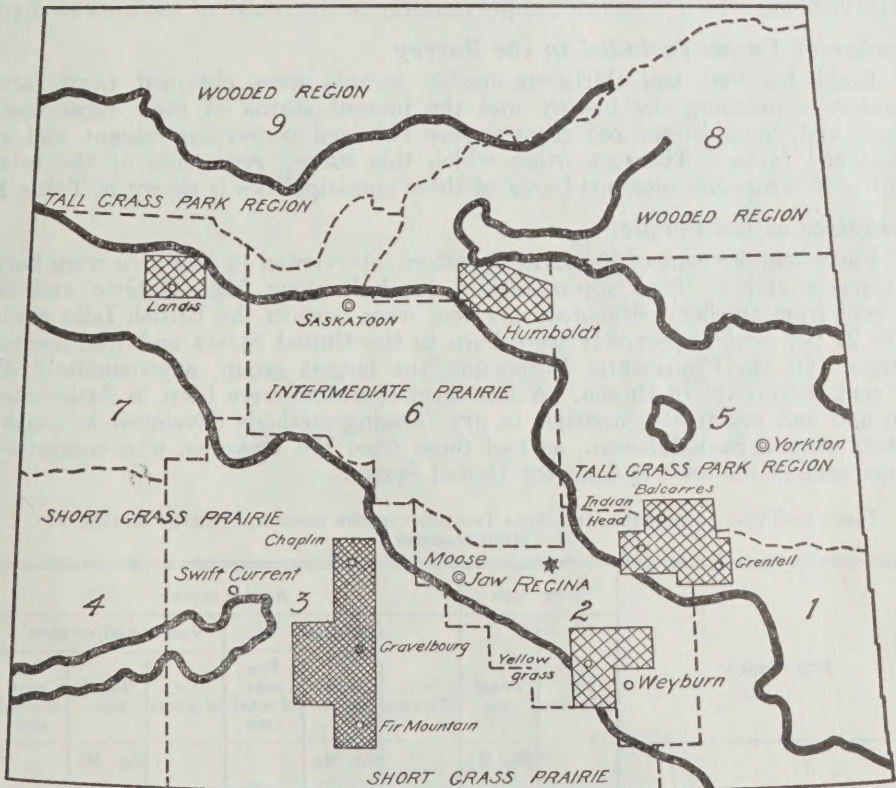
The area selected for this study is in the southwest central part of Saskatchewan, and comprises the Rural Municipalities of Waverley, No. 44, Wood River No. 74, Pinto Creek No. 75², Gravelbourg No. 104, Glen Bain No. 105, Shamrock No. 134 and Chaplin No. 164. The area includes approximately two thousand square miles and in it almost every short grass type of soil is found ranging from the least to about the most productive in the province. The topography varies from broad level plains to hilly and eroded areas. The area is in the centre of a large part of southern Saskatchewan, which suffered from drought and soil drifting.

² Two townships only (Tps. 7 and 8, rge. 7, W. 3rd Mer.)

In common with the rest of this drought-stricken area, it has been necessary for most farmers to turn to relief sources for feed, fodder, seed, fuel and clothing, but possibly the commitments to these sources, if not greater, have had to be continued longer in the region in which this study is located than in any other large contiguous area. Approximately 50 per cent of the co-operators in this study reported having obtained assistance from relief sources for six consecutive years, so that the relief indebtedness alone has grown to such proportions as to make the problems of these farmers not theirs alone, but those of the nation.

AGRICULTURAL REGION SASKATCHEWAN

SHOWING
LOCATION OF AREA OF 1935 ECONOMIC SURVEY AND FOUR AREAS
REPRESENTATIVE OF OTHER PARTS OF THE AGRICULTURAL
REGION OF SASKATCHEWAN REFERRED TO IN THIS REPORT.



The area included in this report is in the southwest central part of Saskatchewan and comprises the Rural Municipalities of Waverley No 44, Wood River No 74, Pinto Creek No 75, Gravelbourg No 104, Glen Bain No 105, Shamrock No 134 and Chaplin No 164.

Settlement of Area

The settlement of this area occurred principally in the period from 1910 to 1914, and marks a period of rapid transition from a ranching to a grain producing area. The main line of the Canadian Pacific Railway and the first trans-continental to cross Canada, runs through the municipality of Chaplin and

served as the earliest method of bringing in settlers and providing a means of transporting goods and facilities to and from the settlement. A line running east and west, parallel with its main line and about halfway between it and the international border, was constructed by the Canadian Pacific Railway during the rapid period of settlement from 1911 to 1916; and in the same period, the Canadian Northern built a line approximately parallel to this on the north, which passes through Gravelbourg. Two other branch lines were built during the next decade by the Canadian Pacific Railway. Thus in 1935, the area was served by five lines running in a general direction east and west across the area. Fairly good roads have been constructed. Dirt highways, which are usually well graded and maintained, connect one centre with another. The largest town in the area is Gravelbourg, with a population in 1931 of 1,137⁽³⁾. LaFleche, 12 miles south of Gravelbourg, and Chaplin on the main line of the Canadian Pacific Railway, are important trading centres in the area. Other centres are Shamrock, Kelstern, St. Boswells, Bateman, Woodrow, Meyronne, Glentworth, and Fir Mountain. The nearest city, Moose Jaw, is about 100 miles northeast of Gravelbourg which is situated approximately in the centre of the area studied.

Number of Farms Included in the Survey

Eight hundred and thirty-six usable records were obtained from farm operators concerning the history and the present status of their farm businesses, and, in addition, 240 reports were obtained concerning vacant and/or abandoned farms. The proportion which this survey represents of the total number of farms and total land area of these municipalities is shown in Table 1.

Birthplace of the People

Forty-one per cent of the farm operators interviewed in this area were born in Canada and of these approximately one-half came from Ontario and 30 per cent from Quebec. Seventeen per cent were born in the British Isles while 15 to 27 per cent respectively were born in the United States and Continental Europe. Of the Continental Europeans, the largest group, approximately 30 per cent, were born in Russia. A few farm operators were born in Saskatchewan and had practical experience in dry farming methods developed in south-eastern central Saskatchewan, as had those from the Dakotas, who comprised 13 per cent of the settlers from the United States.

TABLE 1.—TOTAL LAND AREA, AND AREA INCLUDED IN THE ECONOMIC SURVEY OF 1935, BY MUNICIPALITIES

Municipality	Total area		Area in survey					
	(1) No. of farms	Total area	Occupied			Vacant and/or aban'd		
			No. of farms	Total area	Per cent of total area	No. of farms	Total area	Per cent. of total area
		Sq. Mi.		Sq. Mi.			Sq. Mi.	
Chaplin R.M. No. 164.....	317	353	114	101	28.6	81	26.8	7.6
Shamrock R.M. No. 134.....	381	295	122	103	34.9	32	11.5	3.9
Gravelbourg R.M. No. 104.....	470	324	146	133	41.0	4	1.2	0.4
Glen Bain R.M. No. 105.....	433	324	138	120	37.0	10	4.2	1.3
Wood River R.M. No. 74.....	480	324	152	120	37.0	18	7.0	2.2
(2) Pinto Creek R.M. No. 75.....		72	21	21	29.2	35	15.8	21.9
Waverley R.M. No. 44.....	409	324	143	110	34.0	60	24.0	7.4
Total.....		2,016	836	708	35.1	240	90.5	4.5

(1) Census of Canada, Pages 48 to 52.

(2) Two townships only (Tps. 7 and 8, rge. 7, W. 3rd mer.)

³ Census of Canada 1931.

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CLIMATE

General Description of Climate

The climate is typical of northern temperate continental areas. The winters are usually long and rigorous, but are occasionally interrupted by warm winds, which bring quite sudden changes in temperature. Some winters are very mild, and others exceptionally severe. The summers are short and are characterized by cool nights and rather high midsummer temperatures. Hot dry winds are common and when they occur cause considerable crop damage, even when soil moisture conditions are more favourable than usual.

Continuous records of observations on temperature and precipitation since 1910 are available from the meteorological station of Chaplin. These data are summarized in Table 2 for the 25 years from 1910 to 1934 inclusive.

TABLE 2.—SUMMARY OF MONTHLY SEASONAL AND ANNUAL TEMPERATURES AND PRECIPITATION AT CHAPLIN, 1910 TO 1934⁽¹⁾

	Temperature					Precipitation in inches		
	Average 1910-1934	Absolute maximum		Absolute minimum		Average inches	Amount in lowest year 1929	Amount in highest year 1916
	°F.	Year	°F.	Year	°F.			
WINTER.....	8.2	1932	53	1916	-53	1.35	1.21	2.83
December.....	9.9	1913	53	1924	-41	0.41	0.41	0.45
January.....	5.2	1931	52	1916	-53	0.62	0.50	1.88
February.....	9.5	1932	58	1917	-42	0.32	0.30	0.50
SPRING.....	37.7	1934	98	1917	-33	3.23	3.13	3.68
March.....	22.1	1910	75	1917	-33	0.63	0.65	1.80
April.....	40.0	1910	88	1920	-9	0.86	0.97	0.41
May.....	51.0	1934	98	1911	16	1.74	1.51	1.47
SUMMER.....	62.8	1931	104	1919	20	6.38	1.08	11.35
June.....	60.0	1933	102	1919	20	2.64	0.78	4.73
July.....	65.5	1931	104	1928	25	1.86	0.15	5.06
August.....	62.5	1929	98	1911- 28-30	30	1.88	0.15	1.56
FALL.....	38.1	1922	90	1919	-26	2.43	2.10	3.74
September.....	51.7	1922	90	1926	12	1.16	0.75	1.58
October.....	38.8	1910	87	1919	-15	0.85	0.65	1.86
November.....	23.8	1923	66	1919	-26	0.42	0.70	0.30
	36.7	1931	104	1916	-53	13.39	7.52	21.60

(¹) Meteorological Service of Canada.

The average annual temperature from 1910 to 1934 was 36.7°F. Wide ranges in temperature occurred between summer and winter; a maximum of 104°F. was recorded in the summer of 1931 and a minimum of -53°F. in the winter of 1916. The mean winter temperature was 8.2°F., the spring 37.7°F., the summer 62.8°F., and in the fall 38.1°F. during this period.

The average annual precipitation for the 25 years 1910 to 1934 was 13.4 inches, the winter 1.4 inches, the spring 3.2 inches, the summer 6.4 inches and the fall 2.4 inches. This favourable distribution of a comparatively low rainfall is characteristic of semi-arid regions making it possible to produce hard spring wheat of excellent quality. While wide variations in the annual precipitation occurred, greater variations were recorded in the distribution of this precipitation between the summer months and the remainder of the year. The annual precipitation varied from 7.5 inches in 1929 to 21.6 inches in 1916, while the range of the precipitation of the summer months was from 1.1 inches in 1929 to 11.4 inches in 1916.

No adequate records of evaporation within these municipalities are available but it is evident that throughout the area the proportion of the total moisture lost through evaporation is considerably greater than in the eastern and more northerly soil zones. Crop damage by hail is not common, but when it occurs it is usually local in character. Frost damage to grain and vegetables is seldom serious.

"The very great variability in the extent and quality of summer rainfall, and the frequent occurrence of great heat during dry spells, constitute the major problems of agriculture in the Prairie Provinces. The yield of grain and the health of pastures are largely dependent upon the comparatively cool weather and sufficient rain in June and July."⁽⁴⁾

The importance of these factors is emphasized in the data which follow. Precipitation data are presented in conjunction with the average yield of wheat in the municipalities of Chaplin and Shamrock from 1918 to 1934 in Table 3.

TABLE 3.—PRECIPITATION DURING THE GROWING SEASON AND THE CROP YEAR⁽¹⁾, AND THE AVERAGE YIELD OF WHEAT IN THE MUNICIPALITIES OF CHAPLIN No. 164 AND SHAMROCK No. 134, 1918 TO 1934⁽²⁾

Year	Growing Season			Total growing season	Total crop year	Average yield for municipalities of Chaplin and Shamrock ⁽³⁾
	May	June	July			
	inches	inches	inches	inches	inches	bushels
1918.....	1.5	1.2	2.4	5.1	14.6	9.5
1919.....	2.0	3.3	1.7	7.0	11.6	4.5
1920.....	2.2	2.9	2.9	8.0	17.3	13.5
1921.....	1.4	1.3	1.9	4.6	11.0	9.5
1922.....	2.6	0.2	2.6	5.4	16.5	23.0
1923.....	1.6	3.9	3.6	9.1	14.1	19.5
1924.....	1.0	4.4	1.7	7.1	15.8	11.0
1925.....	1.4	2.9	1.2	5.5	14.9	17.8
1926.....	2.9	0.9	1.5	5.3	11.1	15.0
1927.....	6.0	1.1	2.5	9.6	20.9	17.5
1928.....	0.5	6.1	2.5	9.1	15.2	28.0
1929.....	1.5	0.8	0.2	2.5	7.2	4.2
1930.....	1.0	2.7	0.6	4.3	8.8	5.0
1931.....	0.7	2.2	0.5	3.4	7.5	0.0
1932.....	0.5	4.4	4.6	9.5	15.8	4.2
1933.....	2.3	1.7	0.7	4.7	11.7	2.0
1934.....	0.5	4.9	0.6	6.0	14.2	2.5
1918-1934.....	1.74	2.64	1.86	6.2	13.4	11.0

⁽¹⁾ Crop year August 1st to July 31st.

⁽²⁾ Meteorological Service of Canada; continuous meteorological data were not available for other municipalities in the area studied.

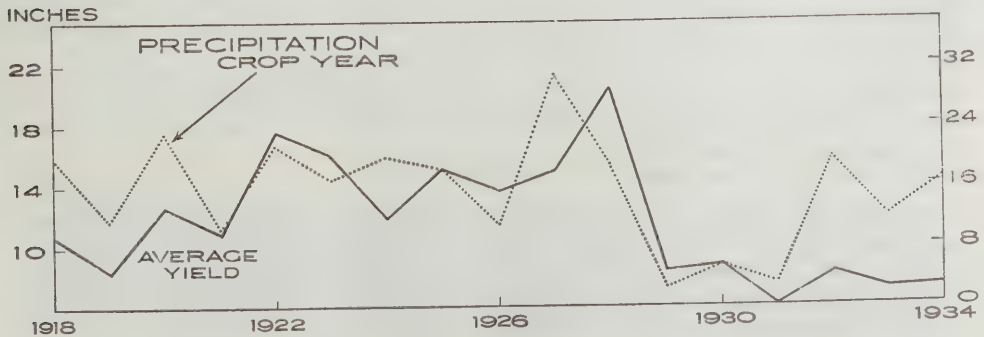
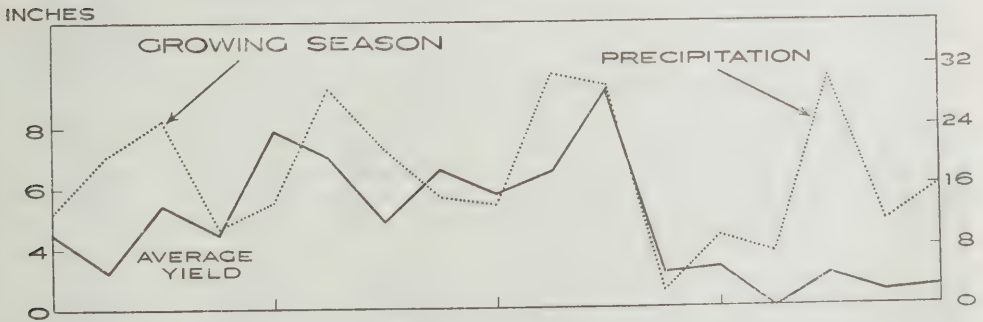
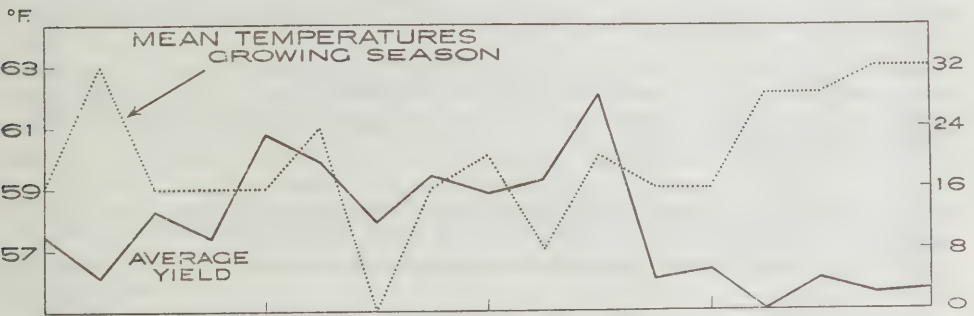
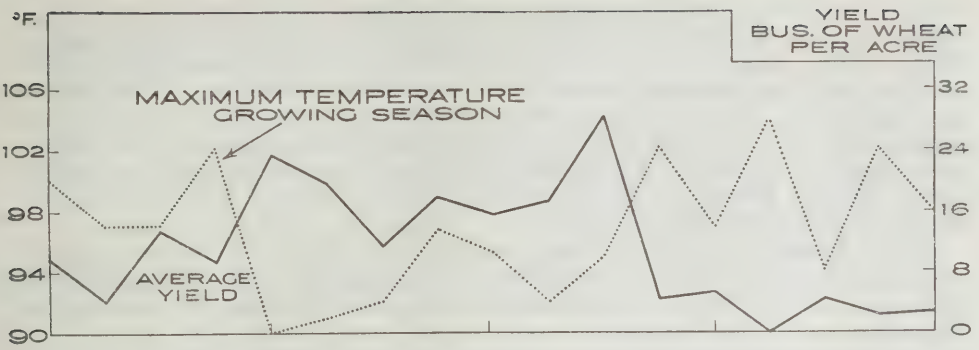
⁽³⁾ Secretary of Statistics, Regina.

For these two municipalities from 1918 to 1934, there was only a slight relationship between the precipitation of any one month of the growing season and the wheat yield. There was a somewhat greater relationship between the total precipitation for the growing season and the yield. The highest yield of wheat occurred in 1928 when the rainfall of the growing season ⁽⁵⁾ amounted to 9.1 inches, and the lowest yield in 1931 when the rainfall of the growing season amounted to only 3.4 inches. In spite of comparatively favourable precipitation during the crop year in 1918, 1932 and 1934, low yields of wheat were harvested.

The average temperature of the growing season was 60°F. from 1910 to 1934, ranging from 55°F. in 1924 to 63°F. in 1919 and in 1933. When the

⁴ Agriculture Climate and Population of the Prairie Provinces of Canada, Page 11.

⁵ Growing Season, May, June and July.



Relation of average yield of wheat per acre to maximum and mean temperatures during growing season and to precipitation during growing season and crop year. Municipalities of Chaplin No. 164 and Shamrock No. 134. 1918 to 1934.

average temperature of the growing season was below 62°F. and the maximum temperature below 97°F. higher yields of wheat were obtained in these municipalities. The maximum temperature was 97°F. or over in every year, 1932 excepted, when the average yield of wheat was below the average yield for the 17-year period. The effect of maximum temperatures on the yield of wheat was considerably less in years when the average summer temperature was below the normal for the period. The mean and maximum temperatures of the growing season and the average yield of wheat for the municipalities of Chaplin and Shamrock are shown in Table 4.

The frequency with which adverse temperatures contributed in limiting the productivity of the soil in production of a satisfactory yield of wheat in the municipalities of Chaplin and Shamrock from 1912 to 1934, is presented in Table 5.

The period of highest average yields of wheat from 1923 to 1928 experienced abnormally high temperatures in only one year. In the six-year period of crop failures from 1929 to 1934, the average temperature of the growing season was above 62°F. in four years and the maximum temperature during the summer was above 97°F. in five years. It is evident, therefore, that a decided relationship exists between the temperatures during the growing season and the yields of wheat obtained in the area.

TABLE 4.—MEAN AND MAXIMUM TEMPERATURE OF THE GROWING SEASON⁽¹⁾ AND THE AVERAGE YIELD OF WHEAT⁽²⁾ FOR THE MUNICIPALITIES OF CHAPLIN No. 164 AND SHAMROCK No. 134, 1918 TO 1934

Year	Mean for May June and July °F.	Absolute maximum °F.	Average yield of wheat for municipali- ties of Chaplin and Shamrock (Bushels)
1918.....	59	100	9.5
1919.....	63	97	4.5
1920.....	59	97	13.5
1921.....	59	102	9.5
1922.....	59	90	23.0
1923.....	61	91	19.5
1924.....	55	92	11.0
1925.....	59	97	17.8
1926.....	60	95	15.0
1927.....	57	92	17.5
1928.....	60	95	28.0
1929.....	59	102	4.2
1930.....	59	97	5.0
1931.....	62	104	0.0
1932.....	62	94	4.2
1933.....	63	102	2.0
1934.....	63	98	2.5
1918 to 1934.....	60	104	11.0

(1) Meteorological Service of Canada.

(2) Secretary of Statistics, Regina.

During the six years 1929 to 1934, the municipalities of Chaplin and Shamrock experienced a combination of weather elements distinctly unfavourable to the production of cereals. Insect pests and soil drifting which are most destructive when weather conditions are unfavourable to cultivated crops, added to the difficulty of obtaining a satisfactory crop.

TABLE 5.—THE FREQUENCY OF THE TEMPERATURE OF GROWING SEASON AVERAGING 62°F. OR OVER; THE MAXIMUM TEMPERATURE 97°F. OR OVER; ⁽¹⁾ AND THE AVERAGE YIELD OF WHEAT PER ACRE FOR THE MUNICIPALITIES OF CHAPLIN AND SHAMROCK, 1912 TO 1934

	Number of years	Frequency mean temperature growing season 62°F. or over	Frequency maximum temperature growing season 97°F. or over	Yield municipalities Chaplin and Shamrock ⁽²⁾ (Bushels)
1912-1917.....	6	0	2	No information
1918-1922.....	5	1	4	12.0
1923-1928.....	6	0	1	18.1
1929-1934.....	6	4	5	3.0

(1) Data assembled from Meteorological Service of Canada.

(2) Secretary of Statistics, Regina.

VARIABILITY IN YIELDS

In this report, average yields of wheat are used in referring to productivity. However, the variation in the yield from one year to another, or from one period to another, is also important. Plans for continued farming are made and commitments undertaken because of the expectation of a crop. Ignoring the effect of price, one would feel reasonably assured of success in carrying out definite plans and being able to meet obligations if one could expect each year a yield closely approximating the long-time average. If, on the contrary, the yield varies anywhere from nothing to thirty bushels per acre, one is considerably handicapped in laying plans for the future.

In order to compare the variability in the yields over the period 1918 to 1934, the coefficient of variability has been computed for the seven municipalities; Crop Districts Nos. 3 and 5; and for the Province of Saskatchewan as a whole. The coefficient of variability is simply a calculated percentage to express the degree to which the annual yields vary from the average yield for the whole period 1918 to 1934. A coefficient of variability in the average annual yields of "0" would indicate the same yield each year throughout the whole 1918 to 1934 period. The more frequently and widely do annual yields depart from the annual average for the whole period the greater is the coefficient of variability.

The coefficient of variability of the average yields of wheat in the seven municipalities from 1918 to 1934 was 72 per cent, while that of Saskatchewan for the same period was 34 per cent. For Crop District No. 3, which includes the seven municipalities studied, the coefficient of variability was 54, and for Crop District No. 5, located in the central eastern part of the province, it was 20.

This variability in the average yields of wheat from 1918 to 1934 for the seven municipalities included in the survey along with that for Crop Districts Nos. 3 and 5, and for all Saskatchewan, is shown graphically on page 18.

TOPOGRAPHY

The topography of the area is decidedly irregular. From both the northern and southern boundaries of the survey for a distance of about six miles, the land is generally rolling. Steep hills are numerous in the southern part, from which for distances varying from fifteen to twenty-five miles, the land is less rolling, gradually emerging into a level and undulating plain, approximately thirty miles across at the greatest width, and narrowing as it extends north and east. Moderately rolling areas out across the plain to the south between the towns of Gravelbourg and LaFleche.

The land in the area in general, is drained to the north and east. The largest body of water is Lake Chaplin in the northern part of the area, the water of which is strongly alkaline. The Chaplin river joins the lake to Johnstone lake some twenty miles to the southeast. Wood river, with a few small creeks tributary to it, drains the central and southern parts of the area, and also joins Johnstone lake to the north and east. Though this describes the natural water course, only in the spring or during periods of unusual rainfall is there any important flow of water through these channels as most of the water disappears through evaporation. Most of the creeks are dry in summer.

SOIL⁶

The area of the economic survey lies in the semi-arid short grass plains belt. Within the area, several soil types have been mapped. The bases of these types are five soil series, namely, Sceptre, Fox Valley, Haverhill, Hatton and Cypress. Characterizing and accounting for the different series are several features, chief of which are mode of derivation, structure, subsoil and the varying amounts of the different soil textures found within each series. The Sceptre series has been derived from post-glacial lacustrine (lake) deposits and the Fox Valley chiefly from silty water-deposited materials. The Haverhill has been derived from glacial till and morainic deposits, making the presence of stones characteristic of this series. Stones are rarely found in the Sceptre or Fox Valley series, or in the Hatton series which is derived chiefly from alluvial deposits.

The structure of the surface soil varies from granular to cloddy in the Sceptre series to structureless in the Hatton. Difference in the structure of the subsoil is also found. In texture, the surface soils vary from very heavy to extremely light. Textural differences in the subsoil are also found, that of Sceptre, Fox Valley and Haverhill being heavy to medium, while in the Hatton series, the subsoils, especially in the lower depths, consist of loose grayish sand. Varying degrees of texture in the different series is, perhaps, the outstanding characteristic giving rise to the different soil types used in the mapping of the area.

Clay is predominant in the Sceptre series, a type found in the immediate vicinity and within a radius of three miles of the town of Gravelbourg. Outside of this extending about twelve miles to the north, four to the east and south and six to the west, occurs the silty clay loam of the Fox Valley series. Another member of the Fox Valley series, the silt loam and loam soil type covers, in a narrow belt, approximately a township in area within this survey north and south of the village of Kelstern, and also extends beyond its boundaries. Still another type of this series, the clay loam with an alkali subsoil, occurs in a strip from one to two miles wide on both sides of the stream, "Wood river," south and west of LaFleche.

The Haverhill series found in this area is more varied in texture than the others, ranging from a clay loam which occurs over a fairly large area, north, east and south of LaFleche, to small patches of light loam and even fine sandy loam. The loam of this series is the most predominant soil, making up more than thirty per cent of the total surveyed area. Frequently this type is found where the topography is rolling and hilly, and is distinctly lighter and less arable than where the topography is level to undulating. In the larger blocks, this type is found in the municipalities of Chaplin, Shamrock, Glen Bain and Waverley.

⁶ See Soil Bulletin, Reports Nos. 1 and 10, by Department of Soils, University of Saskatchewan, Agricultural Extension Dept., University of Saskatchewan.

Textures of light loam to fine sandy loam characterize the Hatton series. Of this series in the area of the survey, the fine sandy loam is the most common. It occurs to the east, southeast and southwest of the alkali flats surrounding Lake Chaplin and occurs also in the northeastern part of the municipality of Gravelbourg, the west central part of Wood River municipality and the east central part of Pinto creek. Hatton fine sandy loam soil is found elsewhere in the area covered by the economic survey, but in smaller blocks.

The moisture holding capacity of these soil types varies from relatively high in the Sceptre clay to low in the Hatton fine sandy loam. The Fox Valley silty clay loam and the Haverhill clay loam which make up almost one-fourth of the area, have fairly good moisture holding capacities. The silt loams and loams of these two series are somewhat inferior, while the light loams and fine sandy loams of the Haverhill and Hatton series are poor in water holding capacity. In soil fertility, the graduations of these soil types are in keeping with their water holding capacities, that of Sceptre clay having a high place in the scale and the Hatton fine sandy loam a low one. The Hatton fine sandy loam, and also the Haverhill light loam and fine sandy loam are poor in both water holding capacity and fertility, particularly on the knolls and hills of districts where the general topography is rolling.

Cypress loam occurs in the extreme south of the area covered by the economic survey in Waverley municipality. It is a darker brown soil than the other types mapped in the area, resulting from development under the more favourable moisture conditions of a higher elevation. This soil type is relatively fertile, but only small patches are suitable for agriculture on account of the steepness of the topography and many deep gullies.

During periods of extreme drought with the crop land in the area the lighter soils, particularly the Hatton fine sandy loam, have been damaged by wind erosion. The heavier soils, especially the Fox Valley silty clay loam, have also suffered to some extent. The soils of the medium texture, particularly the Haverhill loam, have drifted least, except where they occur on knolls and on the hilltops. Where overgrazing has occurred, the lighter soils, particularly the Hatton fine sandy loam, have drifted during periods of drought.

FACTORS TO BE CONSIDERED IN A LAND USE STUDY

Climate, topography, soil and economic factors, such as distance from market and the density of the settlement, are basic factors determining the type of agriculture that may be carried on, and with which one is concerned in a land utilization study. In general, over a period of years, the climate does not vary widely from one district to another within this area, although records indicate that certain areas more frequently experience hail storms than others. There is evidence that the land with the higher elevation in the southern part of the area surveyed, has a little more rainfall than the rest of the region included in the economic survey, and also on account of that higher elevation, a shorter frost-free period, but these are exceptions to the general climatic conditions described in the foregoing. The topography and soil, however, do vary within the area, and in this study, a broad classification of the farms in the survey according to these natural factors is presented. The purpose of this classification is to attempt to account for the differences in financial success of the farm operators within the area, as is evidenced by programs on the farm or abandonment, and to examine criteria which may serve as a guide in carrying out a land use program.

SOILS GRADED ON PRODUCTIVITY

The Department of Soils of the University of Saskatchewan has arranged the important soil types of the area included in this study according to their productive capacities. Where the topography is level to undulating, the ranking of these in ten classes is as follows:—

1. Sceptre clay.
2. Sceptre clay and Haverhill clay loam mixed.
3. Fox Valley silty clay loam, Haverhill clay loam.
4. Haverhill clay loam and silt loam mixed, Haverhill clay loam and loam, Cypress loam.
5. Fox Valley silt loam, Fox Valley silt loam and loam mixed.
6. Fox Valley clay loam with alkali subsoil.
7. Haverhill silt loam and loam mixed, Haverhill loam.
8. Haverhill light loam, Haverhill loam and fine sandy loam mixed, Haverhill light loam and fine sandy loam mixed, Haverhill light loam and Hatton fine sandy loam mixed.
9. Hatton fine sandy loam.
10. Alkali.

TABLE 6.—AREAS OF THE IMPORTANT SOILS OF THE RURAL MUNICIPALITIES NOS. 44, 74, 104, 105, 134 AND 164 AND TWO TOWNSHIPS IN RURAL MUNICIPALITY NO. 75⁽¹⁾ AND FARMS INCLUDED IN THE ECONOMIC SURVEY 1935

	Area of survey ⁽²⁾				
	Occupied Farms			Vacant and/or abandoned farms	
	(2) Total area	Area	Per cent of total area	Area	Per cent of total area
	sq. mi.	sq. mi.	%	sq. mi.	%
1. Sceptre clay.....	21.0	12.5	59.5	.....	.....
2. Sceptre clay and Haverhill clay loam mixed..	120.0	46.5	38.8	1.2	1.0
3. Fox Valley silty clay loam Haverhill clay loam	373.0	131.3	35.2	3.0	0.8
4. Haverhill clay loam and silt loam mixed, Haverhill clay loam and loam mixed, Cypress loam.....	219.0	97.3	44.4	5.0	2.3
5. Fox Valley silt loam, Fox Valley silt loam and loam mixed.....	109.0	36.0	33.0	1.2	1.1
6. Fox Valley clay loam with alkali subsoil.....	75.0	18.9	25.2	0.2	0.3
7. Haverhill silt loam and loam mixed, Haverhill loam.....	581.0	167.1	28.8	18.5	3.2
8. Haverhill light loam, Haverhill loam and fine sandy loam mixed, Haverhill light loam and fine sandy loam mixed, Haverhill light loam and Hatton fine sandy loam mixed.....	240.0	97.4	40.6	26.0	10.8
9. Hatton fine sandy loam.....	193.0	97.6	50.6	33.6	17.4
10. Alkali.....	86.0	4.0	4.6	1.8	2.1
All soil types.....	2,017.0	709.0	35.2	90.5	4.5

(1) Tps. 7 and 8, rge. 7, W. 3rd. mer.

(2) Calculated by planimeter on basis of level topography from soil map.

(3) Approximate only, farms classed according to predominate soil type.

An inventory of the soils in Rural Municipalities Nos. 44, 74, 104, 105, 134 and 164 and two townships in Rural Municipality No. 75 with that of the farms included in the economic survey 1935, appears in Table 6.

RELATIONSHIP OF THE TOPOGRAPHY OF THE LAND TO PRODUCTIVITY

The preceding rating of the soil is premised on a level to undulating topography. Where the topography is gently to moderately rolling, the same soil type is at least one grade lower than where the topography is level to undulating. Where the topography is strongly rolling to steep, the same soil type is at least two, or possibly more, grades lower than where the topography is level to undulating. Thus, Haverhill loam, which may occur where the topography varies from level to steep, will be at least two grades above the Hatton fine sandy loam in its productive capacity if the topography of both soil types is level or fairly so; but if the topography is strongly rolling to steep, the Haverhill loam is not likely to be any more productive than the Hatton fine sandy loam with a level topography.

Though the productivity of the land is very important, the amount of arable land per quarter-section is equally important from an economic standpoint. Assuming the type of agriculture is dependent on the arable land being cropped, it is the bushels per quarter section, or better still the bushels per farm, that matter rather than the bushels per acre, provided always that the costs do not exceed the returns. As the topography becomes more rolling, there is usually a smaller proportion of the total area that can be cropped. Though soil type is important and basic to a study of land utilization, it cannot be considered in such a study without recognizing the great importance of topography. Since the first concern in a study of land utilization is the determination of the amount of arable land, a broad classification of the land included in the survey has been made according to topography. The classification is as follows:—

1. Level to undulating.
2. Gently to moderately rolling.
3. Strongly rolling to steep and eroded.

TABLE 7.—OCCUPIED AND VACANT AND/OR ABANDONED FARMS OF EACH CLASS OF TOPOGRAPHY, SHOWING TOTAL ACRES, AND ACRES IMPROVED PER FARM, ECONOMIC SURVEY, SOUTHWEST CENTRAL SASKATCHEWAN 1935

Topography	Occupied farms				Vacant and/or abandoned farms			
	No. of farms	Total acres per farm	Acres improved	Per cent improved is of total	No. of farms	Total acres per farm	Acres improved	Per cent improved is of total
Level to undulating.....	290	560	481	85.8	47	282	44	15.7
Gently to moderately rolling.....	439	538	431	80.1	150	230	28	12.2
Strongly rolling to steep and eroded.....	107	513	282	55.1	43	234	12	5.3
All descriptions.....	836	542	429	79.1	240	241	28	11.8

The number of occupied, and vacant and/or abandoned farms, and the total acres and acres improved per farm according to topography is reported in Table 7.

Of the occupied farms included in the survey, where the topography was level to undulating an average of 86 per cent of the total acreage per farm was improved compared with 80 per cent where the topography was gently to moderately rolling and only 55 per cent where the topography was strongly rolling to steep and eroded. For commercial grain production, the comparative advantage of farmers on farms with the more level topography is obvious.

WHEAT YIELDS OF THE AREA

Municipal Average and Averages of Estimates of Wheat Yields Provided by Farmers Co-operating in Survey

Four hundred and fifty of the 836 farmers co-operating in this study gave usable information on the history of wheat yields per acre on their farms. This information was obtained largely from estimates made by the farmers, and a considerable proportion of these estimates related to each year in which wheat was sown. A few were able to provide actual records of yields of wheat for each year of the full term they had operated their farms. The averages computed from this information for the years 1920 to 1934, and those computed from statistics provided for the same period by the Statistics Branch of the Department of Agriculture at Regina, by municipalities, appear in Table 8.

Wheat has been the most important source of revenue on these farms. Eighty-six per cent of the total income for the crop year 1927-28 of farm operators co-operating in a farm management survey conducted by the Farm Management Department, University of Saskatchewan, in the Swift Current-Gull Lake area, northwest of the area under review, was from wheat sales. The yield of wheat is the most significant factor determining farm income in this area over a period of years.

Wheat Yields by Topography and Soil

When the records of the 450 farms on which information on wheat yields was obtained are arranged in three classes according to topography, and then sorted within these classes according to the predominant soil type or types, it is possible to compare the average yields per acre of wheat for one soil type (or types) with those of the others within the same topography class.

TABLE 8.—AVERAGE ANNUAL YIELDS OF WHEAT PER ACRE FROM 1920 TO 1934, FOR RURAL MUNICIPALITIES NOS. 44, 74, 75, 104, 134 AND 164, AND AVERAGES OF ESTIMATES OF 450 OPERATORS OF THESE MUNICIPALITIES INCLUDED IN THE ECONOMIC SURVEY, 1935

Municipalities	Provincial reports of average yield of wheat per acre 1920-1934 ⁽¹⁾	Economic Survey 1935	
		Operators' estimates of average yield of wheat per acre 1920-1934	Number of operators supplying information
	Bush.	Bush.	
Waverley R.M. No. 44.....	11.6	11.2	69
Wood River R.M. No. 74.....	13.3	13.1	74
Pinto Creek R.M. No. 75.....	12.4	12.7 ⁽²⁾	7 ⁽²⁾
Gravelbourg R.M. No. 104.....	13.2	12.8	97
Glen Bain R.M. No. 105.....	12.4	12.7	63
Shamrock R.M. No. 134.....	12.0	9.7	67
Chaplin R.M. No. 164.....	10.4	10.6	72
Seven Municipalities.....	12.4 ⁽³⁾	11.8	450

(¹) Reports of Secretary of Statistics, Regina.

(²) Data available for two townships only (Tps. 7 and 8, rge. 7, W. 3rd mer.)

(³) Average of averages.

By taking the whole farm area into consideration, it is possible to compare the average yield per acre of the whole farm area (wheat acreage, other cropland and unimproved) for one soil type or types, in one topography class,

with that of the same type or types in another topography class. Such figures are much better indicators of the relative productivity of the farms on the different soil types than are the average yields obtained per acre from the land actually planted to that crop. A farm has been taken as a unit. The land cultivated is likely to be on the parts of the farm where the topography is least rolling. On some farms where only a small proportion of the total farm is cultivated, the actual cropland may be level or undulating and not of the same general character as the rest of the farm land which relegates it to the rolling and steep topography class.

Table 9 presents the averages of estimates provided by the 450 farm operators of wheat yields per acre from 1920 to 1934 as sorted according to the topography of the farms and subsorted into groups according to soil type or types.

TABLE 9.—AVERAGES OF ESTIMATES OF WHEAT YIELDS PER ACRE FROM 1920 TO 1934 ACCORDING TO TOPOGRAPHY AND SOIL, 450 FARM OPERATORS, ECONOMIC SURVEY, SOUTHWEST CENTRAL SASKATCHEWAN 1935

Topography and soil	Number of operators estimating yields of wheat	Average wheat yields per acre 1920-1934	Average yield of wheat per acre of total farm area
		Bush.	Bush.
<i>Level to undulating—</i>			
1. Sceptre clay.....	10	14.0	8.0
2. Sceptre clay and Haverhill clay loam mixed.....	9	14.3	5.9
3. Fox Valley silty clay loam, Haverhill clay loam.....	60	13.4	7.3
4. Haverhill clay loam and silt loam mixed, Haverhill clay loam and loam mixed.....	1	14.0	6.8
5. Fox Valley silt loam, Fox Valley silt loam and loam mixed.....	16	11.7	5.6
6. Fox Valley clay loam with alkali subsoil.....	4	11.0	4.5
7. Haverhill silt loam and loam mixed, Haverhill loam.....	19	11.8	5.6
8. Haverhill light loam, Haverhill loam and fine sandy loam mixed, Haverhill light loam and fine sandy loam mixed, Haverhill light loam and Hatton fine sandy loam mixed.....	12	13.0	4.6
9. Hatton fine sandy loam.....	13	9.0	4.2
10. Alkali ⁽¹⁾			
<i>Gently to moderately rolling—</i>			
2. Sceptre clay and Haverhill clay loam mixed.....	6	15.7	7.3
3. Fox Valley silty clay loam, Haverhill clay loam.....	33	13.2	6.1
4. Haverhill clay loam and silt loam mixed, Haverhill clay loam and loam mixed.....	53	11.9	5.6
5. Fox Valley silt loam, Fox Valley silt loam and loam mixed.....	6	11.8	5.6
6. Fox Valley clay loam with alkali subsoil.....	4	10.5	3.3
7. Haverhill silt loam and loam mixed, Haverhill loam.....	64	11.1	5.0
8. Haverhill light loam, Haverhill loam and fine sandy loam mixed, Haverhill light loam and fine sandy loam mixed, Haverhill light loam and Hatton fine sandy loam mixed.....	22	11.3	3.7
9. Hatton fine sandy loam.....	50	9.8	3.8
<i>Strongly rolling to steep—</i>			
3. Fox Valley silty clay loam, Haverhill clay loam.....	1	16.0	8.0
4. Haverhill clay loam and silt loam mixed, Haverhill clay loam and loam mixed, Cypress loam.....	17	12.6	4.7
7. Haverhill silt loam and loam mixed, Haverhill loam.....	31	10.8	3.1
8. Haverhill light loam, Haverhill loam and fine sandy loam mixed, Haverhill light loam and fine sandy loam mixed, Haverhill light loam and Hatton fine sandy loam mixed.....	19	10.5	3.2
9. Hatton fine sandy loam ⁽¹⁾			

(¹) Estimates not obtained or incomplete for farms on these soil types.

In general, the average wheat yields from 1920 to 1934 were highest on the clay and clay loam soils and lowest on the fine sandy loam. Except in any soil group in which the number of operators estimating yields of wheat was

very few, the average yield of wheat per acre of the total farm area for the same soil type was highest where the topography was level to undulating and lowest where the topography was strongly rolling to steep. It is necessary to indicate that there were exceptions but where such occurred, the sample of farms from which estimates were obtained was small. It is the "usual" rather than the "unusual" with which one is concerned in an economic analysis of this kind. Although there are weaknesses in using arithmetic averages in determining the "usual," this procedure is probably the most satisfactory for this analysis.

Wheat Yields as a Basis of Comparison

On the basis of the data presented in Table 9, a simpler grouping of the soil types has been made which will be referred to as soil groups unless otherwise noted throughout this study. Three groups of soil types have been made: (1) clays and clay loams, (2) silt loams and loams, and (3) light loams and fine sandy loam. The clays and clay loams include farms where the predominating soil types are Sceptre clay, Sceptre clay and Haverhill clay loam mixed, Fox Valley silty clay loam, Haverhill clay loam, Haverhill clay loam and silt loam mixed and Haverhill clay loam and loam mixed. The silt loams and loams (group 2), include Fox Valley silt loam, Fox Valley silt loam and loam mixed, Haverhill silt loam and loam mixed, Haverhill loam and to this is added Fox Valley clay loam with an alkali subsoil. The third group, light loams and fine sandy loam, includes Haverhill light loam, Haverhill loam and Hatton fine sandy loam mixed, Hatton fine sandy loam and to this is added four farms where the predominating soil is alkali.

The above soil types predominate on the farms included in the survey where the topography is level to undulating. Where the topography is gently to moderately rolling and also where the topography is strongly rolling to steep, there were no farms where the Sceptre clay predominated or in the "clays and clay loams" group, nor does the first group include the Haverhill clay series on a strongly rolling to steep topography.

In the first group, according to soils of the third topography class (strongly rolling to steep), there is added Cypress loam, a type predominating on a few farms where the topography is strongly rolling and which has been appraised by the Department of Soils as being superior to the loams of the other series found in the area surveyed. In this class, there were no farms where Fox Valley silt loam, or silt loam and loam mixed, or Fox Valley clay loam with an alkali subsoil are found and so these types do not occur in the second soil group, the silt loams and loams.

The 836 farms have been arranged into three classes according to topography, and each topography class contains three groups according to the predominating soil types found thereon. This classification and grouping will be used in much of the study presented herein.

The averages of estimates of wheat yields provided by the 450 farm operators for the 15 years, 1920 to 1934, have been arranged according to the three classes of topography on the farms operated and subsorted into the three groups of soils described in the foregoing and are presented in Table 10.

This analysis sums up what has been noted in Table 9, that for the 15-year period from 1920 to 1934, the average wheat yield was higher on farms where the predominating soil types were clays and clay loams or mixtures of these types, than on the farms where the predominating soil types were light loams, fine sandy loam or mixtures. Yields of wheat on farms on silt loams, loams or mixtures of these soils, were intermediate between these groups. The higher yields per acre of the total farm area where the topography was level or less rolling indicate that there was considerably more wheat produced on these

farms than where the topography was more rolling. For each topography class, there was also considerably more wheat produced on the farms where the soil was heavier.

TABLE 10.—AVERAGES OF THE ESTIMATES OF WHEAT YIELDS FOR THE 15 YEARS 1920 TO 1934 PROVIDED BY 450 FARM OPERATORS BY TOPOGRAPHY CLASSES AND SOIL GROUPS, SOUTHWEST CENTRAL SASKATCHEWAN, 1935

Topography and soil	Number of operators supplying information	Average bushels per acre of wheat 1920-1934	Average bushels of wheat per acre of total farm area
<i>Level to undulating—</i>			
Clays and clay loams.....	80	13.6	7.2
Silt loams and loams.....	39	11.7	5.5
Light loams and fine sandy loam.....	25	10.9	4.4
All soils.....	144	12.6	6.4
<i>Gently to moderately rolling—</i>			
Clays and clay loams.....	92	12.6	5.9
Silt loams and loams.....	74	11.1	5.0
Light loams and fine sandy loam.....	72	10.3	3.7
All soils.....	238	11.4	4.9
<i>Strongly rolling to steep—</i>			
Clay loams.....	18	12.8	4.9
Silt loams and loams.....	31	10.8	3.1
Light loams and fine sandy loam.....	19	10.5	3.2
All soils.....	68	11.2	3.6
All Farms.....	450	11.8	5.2

The averages of the estimates of wheat yields in Tables 9 and 10 for the 15-year period cover the six consecutive years of partial and complete crop failures from 1929 to 1934. The average annual wheat yield for these drought years was approximately three bushels per acre on the clays and clay loams, and about one bushel per acre on the light loams and fine sandy loam for the three classes of topography.

TABLE 11.—PERCENTAGE DISTRIBUTION OF THE AVERAGE OF THE OPERATORS' ESTIMATES OF WHEAT CROP YIELDS FROM 1920 TO 1934 BY SOIL GROUPS, SOUTHWEST CENTRAL SASKATCHEWAN, 1935

Average wheat yield per acre 1920 to 1934	Percentage of estimates of average wheat yield 1920 to 1934 within groups		
	Clays and clay loams	Silt loams and loams	Light loams and fine sandy loam
Bushels—			
1 to 5.....	3	9	14
6 to 9.....	12	15	17
10 to 12.....	32	42	44
13 to 15.....	28	25	22
16 to 19.....	18	8	3
20 bushels or more.....	7	1	0
Number of farmers supplying information.....	190	144	116

On the clays and clay loam soils, 25 per cent of the operators supplying the information on wheat yields reported an average yield of 16 bushels or more from 1920 to 1934, compared with nine per cent and three per cent on the medium and light soil types respectively. The percentage distribution of the average of operators' estimates by wheat yields from 1920 to 1934 for the classes of soils on which the farms are located is shown in Table 11.

On the heavier soils, 52 per cent of the operators reported some crop sales, while on the lighter soils only 20 per cent had any crop to sell, Table 12. The value of crop sales per acre of cropland, however, was small, averaging for the operators who made sales, 63 cents for farms on the clays and clay loams, and 35 cents for farms on the light loams and fine sandy loam.

TABLE 12.—NUMBER OF FARMERS AND THE PERCENTAGE OF FARMS IN EACH CLASS OF TENURE BY SOIL GROUPS FROM WHICH SALES WERE MADE FROM THE 1934 CROP, SOUTHWEST CENTRAL SASKATCHEWAN, 1935

	Number of farmers in survey			Percentage of farms with crop sales, 1934		
	Clays and clay loams	Silt loams and loams	Light loams and fine sandy loam	Clays and clay loams	Silt loams and loams	Light loams and fine sandy loam
Owners.....	211	164	154	50	45	18
Owner-tenants.....	69	58	42	61	38	33
Tenants.....	56	39	43	50	33	16
All tenures.....	366	261	239	52	42	20

POPULATION

Changes in Population Numbers

The first Census reports of population for Saskatchewan were made in 1901 when there were 19 persons reported to be living in the area surveyed. Sixteen of these were living north of Lake Chaplin in Townships 17 and 18, Ranges 5 and 6, W. 3rd meridian, not far from the main line of the Canadian Pacific Railway, and the other three were in Township 14, Range 4, W. 3rd meridian, which is south and east of the lake. For 1906, five years later, the Census reports 220 persons and these were located largely in the same area

TABLE 13.—STATISTICS OF POPULATION, TOTAL AND RURAL OF SASKATCHEWAN AND OF THE MUNICIPALITIES INCLUDED IN THE ECONOMIC SURVEY, SOUTHWEST CENTRAL SASKATCHEWAN, 1935—BY CENSUS YEARS 1901 TO 1936⁽¹⁾

Year	Saskatchewan		Seven municipalities Southwest Central Saskatchewan	
	Total population	Rural population	Total population	Rural population
1901.....	91,279	76,674	19	19
1906.....	257,763	208,788	220	220
1911.....	492,432	359,475	4,637	4,637
1916.....	647,835	472,920	11,053	9,641
1921.....	757,510	537,832	12,815	10,698
1926.....	820,738	656,590	14,696	11,753
1931.....	921,785	626,814	13,988	11,163
1936 ⁽²⁾	930,977	.....	12,383	9,673

⁽¹⁾ Census of Canada.

⁽²⁾ Preliminary figures supplied by Census Division, Dominion Bureau of Statistics.

north of Lake Chaplin, though a few were living in the townships surrounding the present town of Gravelbourg. In 1911, the population in the seven municipalities exceeded 4,600 and from then until 1916 occurred the greatest increase—the population more than doubling. The population continued to increase until 1926, when it appears to have been at its maximum. By the next Census year, 1931, a decrease of four per cent in the population had occurred and a still further decrease of 11 per cent by 1936. The farm population of this area in 1936 is only slightly greater than it was in 1916. It is interesting to contrast this with what has occurred in the changes of population during this same period in the province as a whole, figures for which are presented in Table 13.

Relation of Soils to Population Density

The heavier soils support a larger population per square mile than do the lighter ones, and have done so since the beginning of settlement. On the clays and clay loam soils and also for the loams and silt loams, the period of saturation appears to have been reached in 1926. With the fine sandy loam, however, the period of saturation was some five years earlier, about 1921, the population per square mile remaining at 4.1 in 1926, and then declining to 3.7 in 1931 and to 3.0 in 1936. In 1926, the Census year in which the greatest farm population was reported in this area, there were 6.9 persons per square mile on the clays and clay loam soils, compared with 5.8 on silt loams and loams, 5.0 on light loams and 4.1 for fine sandy loams. Census figures for 1936 indicate that the population in these municipalities decreased further during the most recent five-year period on all groups of soils to 5.6 persons per square mile on the clays and clay loams and to 3.0 for the fine sandy loam, a decrease of 11 and 17 per cent respectively from the 1931 population.

The farm population per square mile by soil groups for Census years is reported in Table 14.

TABLE 14.—FARM POPULATION PER SQUARE MILE IN CENSUS YEARS FOR THE MUNICIPALITIES INCLUDED IN SOUTHWEST CENTRAL SASKATCHEWAN, 1935, BY SOIL GROUPS⁽¹⁾—1901 TO 1936

Year	General area	Clays and clay loams	Silt loams and loams	Light loam	Fine sandy loam
1901.....					
1906.....	0.1				
1911.....	2.3	3.3	1.0	1.4	1.6
1916.....	4.8	5.6	4.6	4.0	3.9
1921.....	5.3	6.3	5.2	4.4	4.1
1926.....	5.8	6.9	5.8	5.0	4.1
1931.....	5.0	6.3	5.6	5.9	3.7
1936.....	4.8	5.6	5.0	4.5	3.0

(¹) Clay and clay loams include townships 4 and 8,-11, range 4-6; township 12, range 4-5; township 11, range 7-9; all west of the 3rd meridian.

Silt loams and loams include townships 7 and 13, range 4-6; townships 6 and 14, range 5-6; township 15, range 6; townships 10, 11 and 12, range 7-9, all west of the 3rd meridian.

Light loams include township 5, range 4-6; township 6, range 4; townships 7 and 8, range 7; all west of the 3rd meridian.

Fine sandy loams include township 15, range 4-5; township 14, range 4; townships 16 and 17, range 4-6; township 12, range 6; all west of the third meridian.

LAND TENURE

Relation of Topography and Soil to Land Tenure

Of the farms included in the survey in 1935, approximately 63 per cent were owner-operated, 20 per cent partly owned and partly rented by their operators, and 17 per cent of the farms were rented. A somewhat larger proportion of the farms with the topography strongly rolling to steep were fully owned than of the farms where the topography was less rolling—79 per cent as compared with 61 per cent for the respective classes. Only 10 per cent of the farms having topography strongly rolling to steep were operated by tenants, while 19 per cent of the farms on which the topography was level to undulating were operated by tenants. No significant differences in the proportions of the different classes of tenure appeared for the soil groups.

The percentage of farm operators of the different classes of tenure located on farms of the various classes of topography and soil is shown in Table 15.

USE OF LAND

Size of Farms and Use of Land by Municipalities

The average total area of the farms of the survey was 542 acres. The average for Saskatchewan in 1931 according to the Dominion Census was 408 acres. The municipality of Gravelbourg showed the largest average farm area (excluding Pinto Creek) and Waverley the smallest, but in all municipalities the average size exceeded three-quarters of a section.

About 90 per cent of the land on the farms in the municipalities of Wood River, Gravelbourg and Glen Bain was improved, but less than 60 per cent in the municipality of Chaplin, while the average for all municipalities was approximately 80 per cent. In 1935, the acreage sown to wheat averaged 41 per cent of the cropland for all farms surveyed in the seven municipalities, the smallest proportion being in Chaplin, where a larger acreage of rye was sown than in the other municipalities.

TABLE 15.—LAND TENURE ACCORDING TO TOPOGRAPHY AND SOIL, SOUTHWEST CENTRAL SASKATCHEWAN, 1935

Topography and soil	Number of operators	Percentage of operators		
		Owners	Part-owners	Tenants
<i>Level to undulating—</i>				
Clays and clay loams.....	148	62	18	20
Silt loams and loams.....	74	59	27	14
Light loams and fine sandy loam.....	68	60	16	24
All soils.....	290	61	20	19
<i>Gently to moderately rolling—</i>				
Clays and clay loams.....	155	59	26	15
Silt loams and loams.....	145	63	21	16
Light loams and fine sandy loam.....	139	62	21	17
All soils.....	439	61	23	16
<i>Strongly rolling to steep—</i>				
Clay loams.....	33	85	6	9
Silt loams and loams.....	42	69	19	12
Light loams and fine sandy loam.....	32	85	6	9
All soils.....	107	79	11	10
All Farms.....	836	529	169	138

There was little difference in the average acreage sown to oats on the farms in the seven municipalities, the average for all farms being 10 per cent of the cropland. The other crops were of less importance, only 6 per cent of the farms visited having legumes and crops for forage other than the cereals. For all farms, the amount fallowed averaged 35 per cent of the total cropland, and that allowed to remain idle accounted for more than 10 per cent. The largest amount of improved land remaining idle was in the two townships of Pinto Creek, which averaged 155 acres per farm or more than 30 per cent of the cropland.

TABLE 16.—USE OF LAND IN FARMS AVERAGED BY MUNICIPALITIES FOR 836 FARMS, SOUTHWEST CENTRAL SASKATCHEWAN, 1935

	All municipalities	Waverley No. 44	Wood River No. 74	Pinto Creek* No. 75	Gravelbourg No. 104	Glen Bain No. 105	Shamrock No. 134	Chaplin No. 164
Number of farms.....	836	143	152	21	146	138	122	144
	acres	acres	acres	acres	acres	acres	acres	acres
Average per farm.....	542	494	506	629	583	557	540	566
Cropland including fallow and breaking.....	429	343	451	494	515	490	418	323
Unimproved and farmstead.....	113	151	55	135	68	67	122	243
Wheat.....	176	119	198	137	246	215	165	102
Oats.....	42	34	43	45	45	41	47	44
Rye.....	8	5	1	18	2	1	14	30
Barley.....	3	2	1	4	3	4	1	7
Flax.....	1	1	1	1	1	1	1	1
Forage crops.....	1	1	1	1	1	1	2	2
Other crops.....	1	1	1	1	1	1	1	1
Fallow and breaking.....	152	121	180	133	197	186	128	85
Idle improved.....	45	60	27	155	21	41	60	52

* Two townships only (townships 7 and 8, range 7, W. 3rd meridian.)

Use of Land According to Topography and Soil

In general, the level phases of land contained the largest percentages of cropland and the more rolling phases, the least. Where the topography varied from level to moderately rolling, the percentage of the total area in cropland was lowest on the lighter soils. On the smooth phases of the clay soils, practically the entire area was in crop and summer-fallow. On the other hand, the proportion of the cropland on these farms which was left idle was greatest on the lighter soils. For farms with level to undulating topography, 4 per cent of the cropland on the clays and clay loams was idle, but this proportion increased to 15 per cent of the cropland on the light loams and fine sandy loams. While a small part of the improved land which remained idle was unused because of the financial inability of the operator to seed or fallow it, the larger part was left idle because it was advisable to do so. During the long period of drought the wind had eroded the soils, removed the surface layer from considerable areas and deposited it very irregularly in other parts of the same field, or in others adjoining which may not have been eroded but have become damaged by the piling drift. More particularly, was this found to be true on the lighter soils.

The percentages of the total farm area in cropland and the use of cropland by percentages, averaged for the 836 farms included in survey according to topography and soil appear in Table 18.

TABLE 17.—USE OF THE LAND IN FARMS, AND OF CROPLAND, BY PERCENTAGES, AVERAGED BY MUNICIPALITIES FOR 836 FARMS, SOUTHWEST CENTRAL SASKATCHEWAN, 1935

	All-municipalities	Waverley No. 44	Wood River No. 74	Pinto Creek* No. 75	Gravelbourg No. 104	Glen Bain No. 105	Shamrock No. 134	Chaplin No. 164
Number of farms.....	836	143	152	21	146	138	122	114
	%	%	%	%	%	%	%	%
Cropland, including fallow and breaking.....	79.1	69.4	89.1	78.5	88.3	88.0	77.4	57.1
Unimproved and farmstead.....	20.9	30.6	10.9	21.5	11.7	12.0	33.6	42.9
Cropland, including fallow and breaking.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Wheat.....	41.0	34.7	43.9	27.8	47.9	43.9	39.4	31.6
Oats.....	10.0	9.8	9.6	9.0	8.7	8.3	11.2	13.6
Rye.....	1.9	1.5	0.2	3.6	0.4	0.2	3.3	9.3
Barley.....	0.7	0.6	0.2	0.8	0.6	0.8	0.2	2.2
Flax.....	0.2	.....	0.2	.....	.....	0.2	.....	.....
Forage crops.....	0.2	0.3	.....	0.2	0.2	0.2	0.8	0.6
Other crops.....	0.2	0.3	.....	0.2	.....	.....	0.2	0.3
Fallow and breaking.....	35.4	35.3	39.9	26.9	38.1	38.0	30.6	26.3
Idle improved.....	10.4	17.5	6.0	31.5	4.1	8.4	14.3	16.1

* Two townships only (townships 7 and 8, range 7, W. 3rd meridian).

Changes in the Use of Land

Previous to 1910, the land in this area was used for ranching. During the five years following, the area was rapidly settled, and by 1916, over one million acres had been included in the occupied farms in the seven municipalities, of

TABLE 18.—PROPORTION OF THE TOTAL FARM AREA OF CROPLAND, AND OF THE CROPLAND USED BY THE IMPORTANT CROPS ON FARMS GROUPED ACCORDING TO TOPOGRAPHY AND SOIL, 836 FARMS, SOUTHWEST CENTRAL SASKATCHEWAN, 1935

	Level to undulating			Gently to moderately rolling			Strongly rolling to steep		
	Clays and clay loams	Silt loams and loams	Light loams and fine sandy loam	Clays and clay loams	Silt loams and loams	Light loams and fine sandy loam	Clay loams	Silt loams and loams	Light loams and fine sandy loam
Number of farms.....	148	74	68	155	145	139	33	42	32
Total area per farm (acres)	586	560	503	526	538	550	475	537	520
Acres of cropland per farm.	526	488	374	461	429	398	293	246	319
	%	%	%	%	%	%	%	%	%
Per cent of total farm area in cropland.....	90	87	74	88	80	72	62	46	61
Cropland, including fallow and breaking.....	100	100	100	100	100	100	100	100	100
Wheat.....	47	45	35	45	42	30	41	41	36
Oats.....	9	9	11	9	11	10	11	16	11
Rye.....	.....	.....	6	.....	1	7	4	2	2
Forage crops.....	.....	.....	.....	.....	.....	1	.....	.....	.....
Other crops(1).....	1	.....	1	1	.....	1	1	3	1
Summerfallow.....	39	36	27	41	35	27	33	34	34
Idle improved.....	4	10	20	4	11	24	9	4	16

(1) Includes barley, flax and other crops not listed.

which more than one-half was improved. The amount of land occupied increased by about 12 per cent from 1916 to 1921, but showed little change during the next five years. In 1931, however, the amount of land occupied was 25 per cent greater than that reported in the Census of 1916.

The percentage of occupied land which had been improved, increased steadily from 1916 to 1931. In 1916, 55 per cent of the land occupied was improved, compared with 67 per cent in 1921, 74 per cent in 1926, and 78 per cent in 1931. (See Table 19.) The survey made in 1935 indicates that very little change had taken place since 1931 in the proportion of occupied land which had been improved. (See Table 17.)

During this period of occupancy and improvement (1916 to 1931) the proportion of total crop acreage of the seven municipalities which was used for wheat increased from 70 to 78 per cent, while that in oats decreased from 19 to 15 per cent. Oats are not as well adapted to the semi-arid conditions of the area as wheat, and the tendency has been to grow less than formerly.

TABLE 19.—TOTAL LAND OCCUPIED AND IMPROVED WITHIN THE MUNICIPALITIES OF WAVERLEY No. 44, WOOD RIVER No. 74, PINTO CREEK No. 75, GRAVELBOURG No. 104, GLEN BAIN No. 105, SHAMROCK No. 134 AND CHAPLIN No. 164—BY CENSUS YEARS⁽¹⁾

Census year	Total land occupied	Total land improved	Percentage improved of occupied
	acres	acres	%
1916.....	1,039,361	571,627	55.0
1921.....	1,163,638	777,625	66.8
1926.....	1,166,030	857,637	73.6
1931.....	1,295,927	1,010,244	78.0

(1) Data from Census of Canada, 1916, 1921, 1926 and 1931.

In 1916, flax occupied 8.6 per cent of the total acreage in crop for the seven municipalities. Each succeeding census record shows a reduced acreage of flax and in 1931, it had fallen to less than one per cent of the total acres in crop. In the earlier years, flax was frequently planted on land immediately after breaking to get a cash crop as quickly as possible, and this probably accounts for part of the larger proportion grown when settlement was in progress. Reduction of acreage has resulted from a number of influences which include wide variations in yields and prices, difficulties of controlling weeds, of handling the crop after maturity and perhaps in some cases flax wilt. Only 13 of the 836 farmers in the survey grew flax in 1934.

The Census reports indicated a slight increase in the proportion of the total crop acreage used for barley from 1926 to 1931, but the proportion is very small, being only 1.9 per cent in 1931. The survey indicated that less than one-half of this proportion was used for barley in 1935. Legumes and grasses were grown to some extent in 1926, but the acreage was less than one-third of one per cent of the total crop area of the seven municipalities. In 1931, this amount had fallen to less than one-third of what it was in 1926, but the survey indicated it was slightly more in 1935.⁽⁷⁾

The growing of rye has increased markedly in the municipality of Chaplin. For this municipality, Census reports indicate a consistent increase in the proportion which the acreage of rye bore to the total crop acreage from less than

(7) "Acreage in Crops" differs from "acres of cropland" used frequently throughout this report, the former does not include fallow, breaking and idle improved.

one per cent in 1916, to more than 24 per cent in 1931. The increase in the proportion of the crop acreage used for rye from 1926 to 1931 was accompanied by a reduction in the proportion used for wheat from 65 to 52 per cent for this municipality. A smaller reduction took place in the proportion used for wheat in Shamrock with an accompanying increase in the proportion used for rye. The survey indicates that for 1935 a somewhat smaller proportion of the total crop acreage of Chaplin was in rye than was reported for 1931 (16 per cent of the acres in crops) and a larger proportion for Shamrock (approximately 6 per cent). Rye is grown on the lighter soils. Approximately 40 per cent of the land surface of the municipality of Chaplin and 14 per cent of the municipality of Shamrock is classified as Hatton fine sandy loam soil.

Table 20 presents a summary of the total acres in crops, and the percentage used for the various crops grown in the municipalities included in the survey of 1935.

The Growing of Fall Rye

Fall rye provides a vegetative cover for the soil in the early spring and thus helps to prevent the soil from drifting. Its use on the lighter soils began some years before the recent prolonged drought period which commenced in 1929. For the years 1924, 1927, and 1929, the returns per acre from fall rye were comparable to the returns per acre from wheat, and farmers were encouraged to grow fall rye; but the comparative returns from wheat and rye which usually prevail is an incentive to grow wheat rather than rye, even though problems with drifting soils might make it advisable to grow rye.

TABLE 20.—TOTAL ACRES IN CROPS, AND THE PERCENTAGE USED FOR VARIOUS CROPS GROWN IN THE MUNICIPALITIES OF WAVERLEY No. 44, WOOD RIVER No. 74, PINTO CREEK No. 75, GRAVELBOURG No. 104, GLEN BAIN No. 105, SHAMROCK No. 134 AND CHAPLIN No. 164¹

Census year	Total acres in crop	Wheat	Oats	Rye	Barley	Flax	Legumes and grasses	Other
		%	%	%	%	%	%	%
1916.....	414,026	70.4	18.8	0.2	0.6	8.6	.....	1.4
1921.....	514,432	73.0	20.1	0.9	0.9	4.2	.....	0.9
1926.....	560,901	77.4	17.3	0.6	0.8	1.8	0.2	1.9
1931.....	602,480	78.5	14.9	3.2	1.9	0.8	0.1	0.6

(¹) Reports of the Census of Canada, 1916, 1921, 1926 and 1931.

The relative attractiveness of wheat and fall rye is indicated in Table 21, which shows the yield, price and value per acre of fall rye and wheat for Crop District No. 3, from 1923 to 1934.

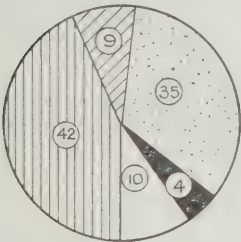
In review, it may be restated that in this area, the proportion of cropland per farm was less on the more rolling land than on the level phases; that the proportion of land which was at one time cultivated, but now allowed to remain idle, was higher on the lighter soils. Very little change took place between 1931 and 1935 in the proportion of the land which had been improved. Since early settlement wheat has been the principal crop. An increased percentage of the acreage in crop devoted to wheat has been reported for each succeeding Census year from 1916 to 1931. While other crops were grown such as oats, rye, barley, flax, and forage crops, these were of small importance compared with wheat. In the area surveyed on the lighter soils, there was an increase in the acreage of rye from 1926 to 1931, but a decrease occurred following that period probably due largely to the relatively lower returns ordinarily obtained from rye as compared with those from wheat.

Use of Land Classified by Topography and Soil¹
Proportion of Total Farm Area Devoted to Various Uses

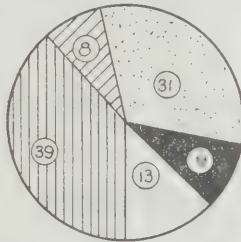


Topography: Level to undulating.

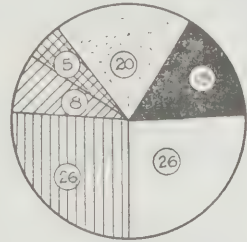
Clays and clay loams



Silt loams and loams

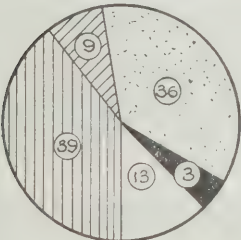


Light loams and fine sandy loam

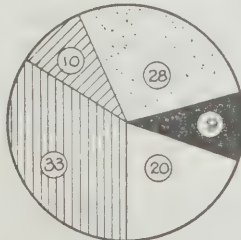


Topography: Gently to moderately rolling.

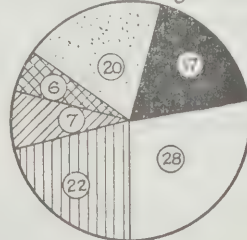
Clays and clay loams



Silt loams and loams

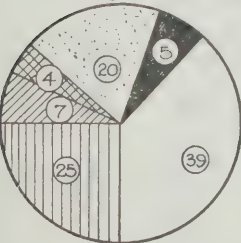


Light loams and fine sandy loams

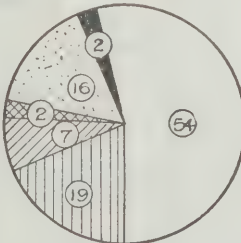


Topography: Strongly rolling to steep.

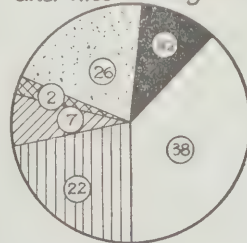
Clay loams



Silt loams and loams



Light loams and fine sandy loams



¹In general, the proportion of cropland per farm decreases as the topography becomes more rolling and the proportion of idle cropland increases as the soils become lighter

TABLE 21.—YIELD, FARM PRICE AND VALUE PER ACRE OF FALL RYE AND WHEAT IN CROP DISTRICT No 3 1923 TO 1934⁽¹⁾

Year	Bushels per acre		Farm price per bushel		Value per acre	
	Fall rye	Wheat	Fall rye	Wheat	Fall rye	Wheat
			\$	\$	\$	\$
1934.....	1.0	2.6	0 46	0 59	0 46	2 14
1933.....	2.7	3.7	0 34	0 45	0 92	1 67
1932.....	6.6	7.7	0 24	0 35	1 58	2 69
1931.....	0.5	2.4	0 23	0 38	0 11	0 92
1930.....	7.2	8.0	0 17	0 47	1 23	3 75
1929.....	7.9	6.8	0 82	1 03	6 47	6 98
1928.....	17.6	25.8	0 74	0 77	13 06	19 83
1927.....	19.7	14.6	0 79	0 97	15 56	14 12
1926.....	15.1	15.8	0 74	1 08	11 16	17 01
1925.....	15.4	17.7	0 72	1 25	11 08	22 14
1924.....	16.4	13.9	0 95	1 21	15 54	16 84
1923.....	16.2	19.5	0 45	0 65	7 32	12 70
1923-34.....	8.7	11.5	0 51	0 86	4 40	9 89

(¹) Estimated yields for each year, Annual Reports of Secretary of Statistics, Department of Agriculture, Regina, Saskatchewan.

LIVE STOCK

The average number of horses and cattle per farm in the area surveyed was larger in 1935 than for Saskatchewan as a whole as reported by the Census 1931, but per 100 acres of occupied land and per 100 acres of cropland the numbers of horses and cattle were less. There were fewer sheep, swine and poultry per farm, per 100 acres occupied and per 100 acres of cropland in the area surveyed than that for all Saskatchewan in 1931. Numbers of live stock per farm, per 100 acres of occupied land and per 100 acres of improved land for Saskatchewan in 1931, and for the 836 farms included in the survey in 1935 appear in Table 22.

TABLE 22.—NUMBERS OF LIVE STOCK PER FARM, PER 100 ACRES OF OCCUPIED LAND AND PER 100 ACRES OF IMPROVED LAND OF SASKATCHEWAN 1931⁽¹⁾, AND FOR THE 836 FARMS INCLUDED IN THE ECONOMIC SURVEY, SOUTHWEST CENTRAL SASKATCHEWAN, 1935

Kind of stock	Number of live stock					
	Per farm		Per 100 acres occupied land		Per 100 acres improved land	
	Sask. 1931	Survey 1935	Sask. 1931	Survey 1935	Sask. 1931	Survey 1935
Horses.....	7.4	8.2	1.8	1.5	3.0	1.9
Cattle.....	8.8	10.8	2.2	2.0	3.6	2.5
Sheep.....	2.1	0.7	0.5	0.2	0.8	0.3
Swine.....	7.0	4.2	1.7	0.8	2.9	1.0
Poultry.....	88.0	59.4	21.6	10.9	35.8	13.8

(¹) Data from Census of Canada 1931.

Relationship of Topography and Soil to Live Stock

There were more horses and cattle on farms where the topography was rolling than on the level to undulating land, but swine and poultry showed the opposite tendency (Table 23). The number of horses per farm was highest on the light soils excepting for the sub-group of clay and clay loam soils with

level topography. On the latter, the average size of farms in total area and also in acres of cropland was larger than the average size of farms in the other groups. The average number of cattle per farm was highest on the light soils where the topography was level to moderately rolling, but where the topography was strongly rolling to steep, there were fewer cattle per farm than on the heavier soils.

Leased Pasture Land ⁽⁸⁾

On the level to undulating phases of the clay and clay loam soils, no farmers leased pasture land; whereas, on the light loams and fine sandy loam, 10 per cent of the farmers held pasture leases, which amounted to 31 per cent of their total pasture land. Where the topography was gently to moderately rolling, the proportion of the pasture land which was leased averaged from 20 per cent for farmers on the heavier soils to 26 per cent for farmers on lighter soils; where the topography was strongly rolling to steep, the average proportion of pasture land leased ranged from 63 per cent for farmers on clay loams to 30 per cent for farmers on the lighter soils.

TABLE 23.—NUMBERS AND CLASSES OF LIVE STOCK PER FARM ACCORDING TO TOPOGRAPHY AND SOIL FOR 836 FARMS INCLUDED IN THE SURVEY, SOUTHWEST CENTRAL SASKATCHEWAN, 1935

Topography and soil	Number of farms in survey	Number per farm			
		Horses	Cattle	Swine	Poultry
<i>Level to undulating—</i>					
Clay and clay loams.....	148	8.5	7.0	4.6	64
Silt loams and loams.....	74	7.5	7.6	4.4	59
Light loams and fine sandy loam.....	68	7.8	11.0	3.0	55
All soils.....	290	8.1	8.1	4.2	60
<i>Gently to moderately rolling—</i>					
Clays and clay loams.....	155	7.4	7.7	4.6	60
Silt loams and loams.....	145	7.8	10.0	4.3	63
Light loams and fine sandy loam.....	139	8.3	13.6	4.6	53
All soils.....	439	7.8	10.3	4.5	59
<i>Strongly rolling to steep—</i>					
Clay loams.....	33	8.5	24.6	3.4	47
Silt loams and loams.....	42	9.1	19.4	3.3	52
Light loams and fine sandy loam.....	32	12.7	16.4	2.6	72
All soils.....	107	10.0	20.1	3.1	56
Total.....	836	8.2	10.8	4.2	59

The alkali flats surrounding Lake Chaplin, the rough eroded land in Waverley municipality, and the range land between Waverley and the International boundary comprise the greater part of this leased land.

The percentage of the total pasture land which was leased by farmers in different topography groups and soil types is stated in Table 24.

⁽⁸⁾ Total area of farm as used in this report does not include leased pasture land.

TABLE 24.—NUMBERS OF FARMS WITH LEASED PASTURE FOR THE VARIOUS TOPOGRAPHY GROUPS AND SOIL TYPES AND THE PERCENTAGE OF THE TOTAL UNIMPROVED LAND WHICH WAS LEASED, SOUTHWEST CENTRAL SASKATCHEWAN, 1935

Topography and soil	Number of farms in survey	Number of farmers with leased land	Leased land percentage as of total unimproved land
			%
<i>Level to undulating—</i>			
Clays and clay loams.....	148		
Silt loams and loams.....	74	5	12
Light loams and fine sandy loam.....	68	7	31
<i>Gently to moderately rolling—</i>			
Clays and clay loams.....	155	5	20
Silt loams and loams.....	145	17	20
Light loams and fine sandy loam.....	139	18	26
<i>Strongly rolling to steep—</i>			
Clay loams.....	33	8	63
Silt loams and loams.....	42	21	38
Light loams and fine sandy loam.....	32	7	30

Changes in Live Stock Population

The total number of horses and cattle per farm indicated in the Census reports for the seven municipalities in the survey increased from 1916 to 1926, but decreased substantially during the next five-year period. There was an increase in the number of sheep per farm for all farms from 1916 to 1921, and little change thereafter. The number of sheep, however, has been insignificant. The total number of hogs and the number per farm showed a large decrease from 1916 to 1921, following which increases in numbers were reported in the next two Census years. The total number of poultry has shown a consistent increase, also the number per farm for each Census year since 1921—the first year for which data on poultry are available.

The study indicates a slight increase over 1931 in the average numbers of all classes of live stock per farm except swine and poultry. The number of poultry per farm in 1935 was considerably less than was reported by the Census for 1931 for these municipalities. The number of cattle per farm, however, has increased considerably, and from the 1935 survey it appears that in these municipalities, there were at that time more than twice as many cattle per farm than in 1931. The kinds and numbers of live stock per farm for each Census year, and for the economic survey of 1935 are shown in Table 25.

TABLE 25.—KINDS AND NUMBERS OF LIVE STOCK PER FARM FOR EACH OF THE CENSUS YEARS 1916, 1921, 1926 AND 1931 FOR THE SEVEN MUNICIPALITIES, AND FOR 836 FARMS INCLUDED IN THE SURVEY, SOUTHWEST CENTRAL SASKATCHEWAN, 1935

Kind of stock	Census				Survey 1935
	1916	1921	1926	1931	
Horses.....	7.0	8.9	11.2	8.0	8.2
Cattle.....	4.7	5.7	6.1	4.9	10.8
Sheep.....	0.1	0.5	0.5	0.5	0.7
Swine.....	4.1	2.6	3.9	4.5	4.2
Poultry.....		65.7	86.5	93.7	59.4

The major reason for the increased number of cattle reported on these farms in 1935 was the low prices which prevailed during the years immediately preceding. There were many cattle kept on the farms that would ordinarily have been sold even though much of the feed required had to be secured through relief

channels. A few farmers reported having to destroy animals because of the impossibility of getting feed during the dry years. The feeding of Russian thistle has been necessary over most of the area studied and on many farms little or no supplementary feeds were available. Despite this, relatively few losses of stock were recorded.

It might be concluded that for the area as a whole, live stock other than work horses, were of little importance, except as a source of meat, milk and eggs to supply the needs of the farm. It is evident that this has been the case since the area was homesteaded. However, where the topography was strongly rolling to steep and also on the lighter soils where the topography was level to moderately rolling, the number of cattle per farm would indicate that they were of some commercial importance because of the possibility of leasing unbroken land nearby.

WATER FACILITIES

The availability of an adequate supply of water is essential to the keeping of live stock. On 64 per cent of the farms, wells were depended on for the water supply; on 15 per cent, dugouts were used in addition to wells; and on 7 per cent, water was obtained from streams. Other sources of water supply were dams and streams. In a few cases, water had to be hauled from neighbouring farms.

Dependence on wells alone for adequate supplies of water was fairly general for farms on the light loams and fine sandy loam soils, but on the clays and clay loams, wells were less satisfactory. Where the topography was level to moderately rolling, less than one-half of the farms on the heavier soils depended upon wells; whereas, 85 per cent of the farms on the lighter soils depended on wells alone for the water supply. The provision of dams and dugouts as sources of water supply occurred more frequently on the clay and clay loam soils.

The different sources of water supply available for farms of the different classes of topography and soil are indicated in Table 26.

TABLE 26.—PERCENTAGE OF FARMS ON THE DIFFERENT CLASSES OF TOPOGRAPHY AND SOILS ON WHICH THE VARIOUS SOURCES OF WATER SUPPLY WERE REPORTED, SOUTHWEST CENTRAL SASKATCHEWAN, 1935

Source	All farms	Gently to moderately rolling ⁽¹⁾			Strongly rolling to steep		
		Clays and clay loams	Silt loams and loams	Light loams and fine sandy loam	Clay loams	Silt loams and loams	Light loams and fine sandy loam
Well.....	64	49	74	85	64	67	69
Well dugout.....	15	20	18	8	3	14	16
Well and stream.....	7	3	.....	2	21	5	12
Dam.....	11	22	8	2	6	2	.....
Stream.....	2	3	.....	2	6	5	3
Cistern.....	.....	1	.....	.....	.....	.....	.....
Neighbouring farm.....	1	2	.....	1	.....	7	.....
Number of farms.....	100 797 ⁽²⁾	100 293	100 201	100 196	100 33	100 42	100 32

⁽¹⁾ Combination of two classes of topography: level to undulating and gently to moderately rolling.

⁽²⁾ Information relating to 39 farms unreported.

The Amount and Quality of Water

The amount and quality of water are much more important than the source of supply. Where the topography was level to moderately rolling, on the lighter soils, more farms had water in excess of the farm needs than was the case on the heavier soils, and a smaller percentage reported a scarcity of water. (See Table

27). Where the farm land was strongly rolling to steep, there did not appear to be much difference in the availability of water on the heavier and lighter soils and about the same proportion of farms on each soil group had a scarcity of water.

TABLE 27.—PERCENTAGE OF FARMERS LOCATED ON EACH CLASS OF TOPOGRAPHY⁽¹⁾ AND SOIL REPORTING THE AMOUNT OF WATER AVAILABLE FOR FARM USE, SOUTHWEST CENTRAL SASKATCHEWAN, 1935

Quantity of water	Level to moderately rolling			Strongly rolling to steep		
	Clays and clay loams	Silt loams and loams	Light loams and fine sandy loam	Clay loams	Silt loams and loams	Light loams and fine sandy loam
Abundant.....	61	72	73	76	60	72
Sufficient.....	28	22	21	15	33	19
Inadequate.....	11	6	6	9	7	9
Number of farms ⁽²⁾	100 293	100 216	100 206	100 33	100 42	100 32

⁽¹⁾ Combination of two classes of topography—level to undulating and gently to moderately rolling.

⁽²⁾ Information relating to 14 of the 836 farms unreported.

Where the topography was level to moderately rolling, the quality of the water in the opinion of the operators was better on the lighter than on the heavier soils. For 71 per cent of the farms on the light loams and fine sandy loam soils, the quality of the water was reported "good" compared with 50 per cent of the farms on the clays and clay loam soils. Water of poor quality was reported on a smaller proportion of the farms with the light loams and sandy loam soils. (Table 28). Where the topography was strongly rolling to steep, the quality of water on the clay loam soils was generally as good as on the lighter soils.

It appears evident that on the lighter soils where the topography is level to moderately rolling, and on all soils where the topography is strongly rolling to steep, that the availability of water in sufficient quantity with a fair to good quality would not prove an obstacle to the keeping of live stock. On the heavier soils with the topography level to moderately rolling, sufficient water for ordinary farm needs may be difficult to provide, consequently may restrict live stock enterprises.

TABLE 28.—PERCENTAGE OF FARMERS LOCATED ON EACH CLASS OF TOPOGRAPHY⁽¹⁾ AND SOIL REPORTING THE QUALITY OF WATER AVAILABLE, SOUTHWEST CENTRAL SASKATCHEWAN, 1935

Quality of water	Level to moderately rolling			Strongly rolling to steep		
	Clay and clay loams	Silt loams and loams	Light loams and fine sandy loam	Clay loams	Silt loams and loams	Light loams and fine sandy loam
Good.....	50	56	71	88	69	72
Fair.....	35	27	19	3	10	3
Poor.....	15	17	10	9	21	25
Number of farms ⁽²⁾	100 293	100 216	100 206	100 33	100 42	100 32

⁽¹⁾ Combination of two classes of topography—level to undulating and gently to moderately rolling.

⁽²⁾ Information relating to 14 of the 836 farms unreported.

FARM BUILDINGS

The size and condition of the buildings usually furnish a good indication of the past productiveness of a district. One of the most useful measures of the size is the cost, provided the buildings were erected within a period of years in which total building costs showed little variation. For the 668 farms on which estimates on building costs were obtained, the average amount involved in building the house and main barn was \$2,258 per farm. Studies made by the Farm Management Department at the University of Saskatchewan indicate that the combined value of the house and main barn constitutes approximately 80 per cent of the total value of the buildings on farms in Saskatchewan. The amount invested in the farm buildings was lowest on the rolling and hilly lands. The cost of the house and main barn on farms with level to undulating topography was approximately two and one-quarter times that shown on farms where the topography was strongly rolling to steep.

Where the topography was level to moderately rolling, the cost of the house and main barn was greater for the farms on the heavier soils, and where the topography was strongly rolling to steep, the cost was slightly less for the heavier soils.

Averages of the estimates of the total cost of house and barn reported by farm operators located on the various classes of topography and soil are shown in Table 29.

TABLE 29.—AVERAGES OF THE ESTIMATES OF THE TOTAL COST OF HOUSE AND BARN REPORTED BY FARM OPERATORS LOCATED ON EACH CLASS OF TOPOGRAPHY AND SOIL, SOUTHWEST CENTRAL SASKATCHEWAN, 1935

Topography	Number of farms on which estimates were obtained	Average total cost of house and barn
<i>Level to undulating—</i>		
Clays and clay loams.....	117	3,392
Silt loams and loams.....	59	3,159
Light loams and fine sandy loam.....	46	2,522
All soils.....	222	3,185
<i>Gently to moderately rolling—</i>		
Clays and clay loams.....	126	2,437
Silt loams and loams.....	114	2,309
Light loams and fine sandy loam.....	113	2,186
All soils.....	353	2,315
<i>Strongly rolling to steep—</i>		
Clay loams.....	27	1,363
Silt loams and loams.....	39	1,428
Light loams and fine sandy loam.....	27	1,522
All soils.....	93	1,437
All Farms.....	668	2,468

Condition of the Principal Farm Buildings

The effect of six years of successive partial or total crop failures is reflected more readily in the condition of the farm buildings than in any other visible factor. It is practically impossible to maintain the buildings on the prairie farms without some cash outlay each year. When the income from the farm is

reduced, one of the first things to be neglected is the upkeep of the farm buildings. This neglect has occurred to a greater or less degree on most of the farms in the study.

TABLE 30.—CONDITION OF THE MAIN BUILDINGS ON FARMS LOCATED ON EACH CLASS OF TOPOGRAPHY AND SOIL, SOUTHWEST CENTRAL SASKATCHEWAN, 1935

Topography and soil	House				Barn			
	Number reported on	Good	Fair	Poor	Number reported on	Good	Fair	Poor
		%	%	%		%	%	%
<i>Level to undulating—</i>								
Clays and clay loams.....	147	22	42	36	146	19	34	47
Silt loams and loams.....	73	18	36	46	73	11	33	56
Light loams and fine sandy loam.....	68	18	32	50	68	7	24	69
All soils.....	288	20	38	42	287	14	32	54
<i>Gently to moderately rolling—</i>								
Clays and clay loams.....	169	12	50	38	155	10	31	59
Silt loams and loams.....	130	7	37	56	142	5	27	68
Light loams and fine sandy loam.....	139	7	39	54	138	6	27	67
All soils.....	438	9	42	49	435	7	29	64
<i>Strongly rolling to steep—</i>								
Clay loams.....	32	6	34	60	31	.....	17	83
Silt loams and loams.....	42	14	57	29	42	7	53	60
Light loams and fine sandy loam.....	32	6	47	47	31	16	42	42
All soils.....	106	9	47	44	104	8	31	61
All Farms.....	832	13	41	46	825	10	30	60

While studying the farms of the area, the buildings were classified according to their condition. Three classes were made: "good," "fair" and "poor." The basis of the classification was the state of repair and general appearance. On farms on the level to moderately rolling topography, a larger percentage of the buildings were classified as "good" and a smaller percentage classified as "poor" on the heavier soils than on the lighter. Where the topography was strongly rolling to steep, no definite relationship of condition of buildings to soil type was shown (Table 30).

The estimates of the amount invested in constructing the main farm buildings were used as a measure of their size. The size of the buildings on the average decreased markedly as the topography became more rolling on the 568 farms on which estimates of building costs were obtained, though not so definitely as the soils became lighter except where the topography was strongly rolling to steep. Classified as to the state of repair and general appearance, there was a large percentage of the buildings described as "good" and a smaller percentage described as "poor" on the farms where the topography was level to undulating than where the topography was more rolling. The same was true for the buildings of the farms on the heavier soils except where the topography was strongly rolling to steep.

VACANT AND ABANDONED FARMS⁽⁹⁾

Vacating and abandonment of farms has been in progress for a number of years, but received an additional impetus during the period 1931 to 1935. In some instances, farms were vacated by the owner temporarily and should not be considered definitely abandoned, but the larger proportion of them might be considered abandoned as far as the last owner-occupier is concerned. The number of vacant and abandoned farms reported by the Census of 1931 in the seven municipalities of this study was 76, but this had increased to 240 by 1935, according to the survey made in these municipalities. The total acres of the farms vacated and abandoned during this four-year period increased from 15,434 in 1931 to more than three and one-half times this amount in 1935. Of the total area vacated and abandoned during these four years, about three-quarters had previously been cultivated land.

In the municipality of Chaplin, 42 farms were reported by the 1931 Census to be vacant or abandoned, and by 1935 the number had increased to 81. This municipality had the largest number of farms vacant and abandoned of all the municipalities included in the survey for both 1931 and 1935. Gravelbourg had been the least affected by abandonments of land for there were none in 1931, and only four in 1935, all of which were on Hatton fine sandy loam.

Table 31 presents data relating to vacant and abandoned farms in the municipalities included in this study, reported by the Census of 1931, and the economic survey of 1935.

Occurrence of Vacant and Abandoned Farms

Where the topography was level to moderately rolling, the vacant and abandoned farms were most numerous on the light loams and fine sandy loam, 147 farms being reported compared with 12 on the clays and clay loams (See Table 32). On the strongly rolling to steep topography no significant differences could be observed in the number of vacant and abandoned farms on the various classes of soil.

TABLE 31.—NUMBERS OF VACANT AND ABANDONED FARMS IN THE MUNICIPALITIES INCLUDED IN THIS STUDY REPORTED BY THE CENSUS OF 1931⁽¹⁾ AND THE ECONOMIC SURVEY OF 1935

Municipality	Number of vacant or abandoned farms		Total number in acres		Acres of improved land	
	1931	1935	1931	1935	1931	1935
Waverley R.M. No. 44.....	5	60	1,440	15,360	1,005	8,810
Wood River R.M. No. 74.....	2	18	315	4,480	100	2,300
Pinto Creek R.M. No. 75.....	18	35	4,000	10,080	2,165	8,930
Gravelbourg R.M. No. 104.....		4		800		580
Glen Bain R.M. No. 105.....	3	10	400	2,720	190	2,440
Shamrock R.M. No. 134.....	6	32	1,439	7,360	220	4,870
Chaplin R.M. No. 164.....	42	81	7,840	17,120	1,995	8,885
Total.....	76	240	15,434	57,920	5,675	36,815

⁽¹⁾ Information supplied by Census Division, Dominion Bureau of Statistics.

⁽²⁾ Two townships only (Tps. 7 and 8, rge. 7, W. 3rd meridian).

The average number of years since these lands were last farmed was least on the heavier soils where the topography was level to moderately rolling.

⁽⁹⁾ The term "vacant and abandoned" as used here includes all farms which were reported to be vacant at the time of the economic survey in 1935. The information available does not distinguish between vacant and abandoned farms.

Tenure of Last Operator

Of the 240 farms which were vacant and abandoned in 1935, more than two-thirds were last farmed by their owners, whose average term of ownership was 11 years. The average term of occupation of the tenants last farming these lands was four years (Table 33).

Reasons for Vacating

In the opinion of farmers residing near these vacant and abandoned farms, 47 per cent were left on account of poor soil, furthermore, 33 per cent went out of use as a result of drought and drifting soils. A summary of the reasons for vacating the farm lands appears in Table 34.

TABLE 32.—RELATIONSHIP OF TOPOGRAPHY AND SOIL TO THE AVERAGE NUMBER OF YEARS SINCE OCCUPATION OF FARMS VACANT AND ABANDONED, SOUTHWEST CENTRAL SASKATCHEWAN, 1935

Topography and soil	Number of farms	Total acreage	Per cent improved	Average number of years since last farmed
<i>Level to moderately rolling—</i>				
Clays and clay loams.....	12	3,200	75	3.0
Silt loams and loams.....	37	8,960	55	5.1
Light loams and fine sandy loam.....	148	35,680	71	5.0 ⁽¹⁾
All soils.....	197	47,840	69	4.9
<i>Strongly rolling to steep—</i>				
Clay loams.....	13	2,720	25	9.2
Silt loams and loams.....	17	3,840	30	10.3
Light loams and fine sandy loam.....	13	3,520	61	4.8
All soils.....	43	10,080	40	8.3
All vacant and abandoned farms.....	240	57,920	64	5.5

(¹) One hundred and forty-seven reports only on this item.

TABLE 33.—TENURE OF LAST OPERATORS OF 240 VACANT AND ABANDONED FARMS INCLUDED IN SOUTHWEST CENTRAL SASKATCHEWAN, 1935

Tenure of last operator	Number of operators	Average years operators of these farms ⁽¹⁾
Owners.....	162	11
Tenants.....	78	4
All tenures.....	240	9

(¹) Only 212 reports included in this item.

Present Ownership

One of many important considerations in this study is the present ownership of these vacant and abandoned farms. The survey of these municipalities indicated that more than one-half of the total acreage of vacant and abandoned farms was privately owned by individuals who formerly had operated these lands or had them farmed by tenants. The next largest group of owners consisted of businesses engaged in loaning to farmers, such as mortgage, life insurance and trust companies, who owned more than a quarter of the total acreage. A statement of the present ownership of these farms, with the percentage of the

total acreage, the average years since last farmed, and the percentage that was formerly in cropland, is presented in Table 35.

TABLE 34.—REASONS GIVEN BY NEIGHBOURS FOR THE VACATING OF FARMS BY THEIR LAST OPERATORS, SOUTHWEST CENTRAL SASKATCHEWAN, 1935

Reasons for Vacating and Abandoning Farms	Number	Per cent
Poor soil.....	112	47
Drought with drifting soil.....	78	33
Financial difficulties.....	25	10
Ill health, old age and death of husband.....	13	5
Too much land.....	6	3
Location.....	3	1
Other reasons.....	3	1
Total.....	240	100

Vacating and abandoning of farms has been in progress in this area for a number of years, but received an additional impetus during the difficult period from 1931 to 1935. The economic survey indicated that the number of vacant and abandoned farms were far more numerous on the lighter soils with level to moderately rolling topography. No significant difference could be observed in the number of vacant and abandoned farms on the various classes of soils where the topography was strongly rolling to steep. "Poor soil" and "drought with drifting soil" accounted for 80 per cent of the vacant and abandoned farms. Fifty-three per cent of this land was privately owned at the time of the survey.

TABLE 35.—OWNERSHIP OF 240 VACANT AND ABANDONED FARMS, SOUTHWEST CENTRAL SASKATCHEWAN, 1935

Present owner	Number of farms	Number of quarters	Per cent of total acreage vacant and abandoned	Average number of years since		Percentage of improved land when operated
				First farmed	Last farmed	
Individuals.....	125	190	53	22	5	68
Mortgage, life insurance, and trust companies.....	64	98	27	23	5	68
Province of Saskatchewan.....	20	32	9	19	7	47
Municipalities.....	16	18	5	23	11	35
Hudson's Bay Co.....	10	18	5	10	5	56
Soldier Settlement Board.....	4	5	1	23	4	78
Unknown.....	1	1	.....	16	3	.....
Total.....	240	362	100	22	6	64

ACQUISITION OF LAND

Many of the present farm operators in Saskatchewan obtained their original holding of land as homesteads. In the area studied, homesteading commenced about 1907, and became general from 1910 to 1934. Of the total acreage obtained during the first ten years of settlement, about 90 per cent was acquired by this method.

The rate of settlement slowed down during the war, and in the period following, the population reached a maximum about 1926. Eighty-two per cent of the farms included in the survey, and 84 per cent of the total acreage obtained in the 10-year period from 1915 to 1924 was acquired by purchase. About two-thirds of these purchases were additions to farms previously

acquired. Great activity in purchasing land characterized the period from 1925 to 1929, slightly less than one-third of all the owned land being obtained in this period. Eighty-three per cent of the total acreage, or 447 parcels of land, were purchased in these years, most of them being first and second additions to original holdings.

During the past six years (1930 to 1935) the farmers' ability to pay for land has been seriously impaired. The number of acquisitions of farm lands decreased greatly in this area from 1930 to 1935, during which only 88 parcels were acquired by the farmers included in the study. Sixty-eight per cent of the acreage added in this period was purchased. Legacies constituted an increasingly important mode of obtaining land as the area developed, accounting for 26 per cent of the total acreage obtained by these farmers since 1930. From 1905 to 1924, war veterans obtained 14 parcels of land by soldiers' grants and South African script. A statement of the amounts of farm land acquired by the various methods of acquisition by five-year periods from 1905 to 1929, and since that date, appears on Table 36.

The Average Price of Purchased Land

The average price of the land purchased on the level to undulating topography was \$26.04; on the gently to moderately rolling, \$19.47; and on the strongly rolling, \$11.58 per acre. In the strongly rolling class, parcels of land on each of the soil groups sold for approximately the same price, \$11.58 per acre. In the other topography classes, the price of land was higher on the clays and clay loams, and the lowest on the light loams and fine sandy loam.

TABLE 36.—ACQUISITION OF LAND OCCUPIED BY 698 OWNERS, BY NUMBER OF PARCELS AND BY PERCENTAGE OF ACREAGE, FROM 1904 TO 1935, SOUTHWEST CENTRAL SASKATCHEWAN, 1935

Date acquired		How acquired			
		Home- stead and pre- emption	Soldier grant and script	Purchased (¹)	Legacy
	No	No.	No.	No.	No.
<i>Total number of parcels acquired—</i>					
1905-1909.....	163	159	3	1	.....
1910-1914.....	285	246	4	31	4
1915-1919.....	215	22	4	179	10
1920-1924.....	168	15	3	137	13
1925-1929.....	447	48	.....	383	16
1930-1935.....	88	9	.....	60	19
1905-1935.....	1,366	499	14	791	62
<i>Total acreage acquired—</i>	acres	%	%	%	%
1905-1909.....	47,829	97	2	1	.....
1910-1914.....	76,153	89	2	8	1
1915-1919.....	52,320	9	1	86	4
1920-1924.....	37,834	8	1	82	9
1925-1929.....	104,465	8	.....	88	4
1930-1935.....	22,722	6	.....	68	26
1905-1935.....	341,323	39	1	55	5

(¹) Includes 3 parcels purchased on foreclosure.

The average price of land on the strongly rolling topography was less than on the more level phases, but the proportion of the purchase price still owing was greater than for purchases in the other classes. The debt of these farms in 1935 was 75 per cent of the purchase price for land on the strongly rolling topography, 68 per cent for land on the level to undulating, and 63 per cent

on the gently rolling class. The difficulty of performing field operations, together with the smaller acreage suitable for cultivation on the rougher topographies, limited the operator's ability to pay for his land. The average size of the parcels purchased was slightly less in this class, 228 acres compared with 241 acres in the level to undulating, and in the gently rolling phases.

The relation of topography and soil to the average price of land purchased from 1905 to 1935 by 698 farm operators is summarized in Table 37.

TABLE 37.—RELATIONSHIP OF TOPOGRAPHY AND SOIL TO THE AVERAGE PRICE OF LAND PURCHASED FROM 1905 TO 1935 BY 689 FARM OPERATORS, AND THE PERCENTAGE OF THE PURCHASE PRICE OWING IN 1935, SOUTHWEST CENTRAL SASKATCHEWAN, 1935

Topography and soil	Number of parcels	Average acreage per parcel	Price paid per acre	Per cent of purchase price owing on land in 1935
<i>Level to undulating—</i>			\$	%
Clays and clay loams.....	163	248	29 32	66
Silt loams and loams.....	66	246	24 81	74
Light loams and fine sandy loam.....	62	217	17 70	71
All soils.....	291	241	26 04	68
<i>Gently to moderately rolling—</i>				
Clays and clay loams.....	147	248	24 26	58
Silt loams and loams.....	129	246	19 31	66
Light loams and fine sandy loam.....	116	226	12 98	71
All soils.....	392	241	19 47	63
<i>Strongly rolling to steep—</i>				
Clay loams.....	35	219	11 91	73
Silt loams and loams.....	37	242	11 15	81
Light loams and fine sandy loam.....	33	223	11 77	71
All soils.....	105	228	11 58	75

Progress of Farm Owners in Acquiring Land

Four hundred and forty-five farm owners of this study homesteaded, and 253 obtained their original parcels of land by other methods. The average date of homesteading was 1912, thus the homesteaders' average term of ownership was 23 years. The non-homesteaders commenced farming operations on the average about 1923, and their average length of ownership was 12 years. The homesteaders started on their farms with about 275 acres of land, compared with approximately 304 acres for the non-homesteading owners, and considerably more of them added to their original holdings. Three hundred and twelve, or 70 per cent of the homesteaders made one or more additions to their original holdings, the area of the first addition averaging about 207 acres some eleven years later. After about four years, 30 per cent made second additions increasing the area of their farms by an average of 197 acres. Thirteen per cent acquired a third parcel of land some 16 years after homesteading, five of these operators making fifth additions comprising 320 acres each during this time. The non-homesteaders made fewer, but larger additions and at shorter intervals. One or more additions were made by 37 per cent of these owners within an average of five years after the commencement of ownership, but less than 12 per cent of the non-homesteaders made subsequent additions. Three of them, however, added five parcels of land to their farm businesses within an average term of ten years after commencing ownership within the district.

A summary of the progress made by farm owners in acquiring farm lands is shown in Table 38.

Progress of Farm Owners in Paying for Land

The activity of acquisition of land does not give the entire story of the struggle towards ownership. The data relating to the progress of 689 farm owners in paying for purchased land on the three soil types and by five-year intervals, appear in Table 39.

TABLE 38.—PROGRESS IN ACQUIRING FARM LANDS BY 698 OWNERS INCLUDED IN THE SURVEY MADE OF RURAL MUNICIPALITIES OF WAVERLEY No. 44, WOOD RIVER No. 74, PINTO CREEK No. 75⁽¹⁾, GRAVELBOURG No. 104, GLEN BAIN No. 105, SHAMROCK No. 154 AND CHAPLIN No. 164, IN 1935

	Home- steading owners	Non-home- steading owners
<i>Original Holdings—</i>		
Number of owners.....	445	253
Date ownership commenced (average).....	1,912	1,923
Term of ownership (years per owner).....	23	12
Acres obtained per owner.....	275	304
Owners never purchasing.....	133	22 ⁽²⁾
Owners never acquiring additional land.....	133	159
<i>First Additions of Land—</i>		
Owners making this addition.....	312	94
Acres added per owner.....	207	225
Years after commencement (average).....	11	5
Owners making no other addition.....	180	66
<i>Second Additions of Land—</i>		
Owners making this addition.....	132	28
Acres added per owner.....	197	251
Years after commencement (average).....	15	8
Years after first addition (average).....	8	5
Owners making no further additions.....	73	20
<i>Third Additions of Land—</i>		
Owners making this addition.....	59	8
Acres added per owner.....	224	200
Years after commencement (average).....	16	9
Years after second addition (average).....	5	4
Owners making no further additions.....	46	1
<i>Fourth Additions of Land—</i>		
Owners making this addition.....	13	7
Acres added per owner.....	222	251
Years after third addition (average).....	2	2
Owners making no further additions.....	8	4
<i>Five or More Additions of Land—</i>		
Owners making this addition.....	5	3
Acres added per owner.....	320	213
Years after fourth addition.....	3	1
Years after commencement (average).....	16	10

(1) Two townships only (Townships 7 and 8, range 7, W. 3rd meridian).

(2) Legacies.

Since 1905, about equal interest was taken in the purchase of land on the various soil groups. The greatest activity in acquiring farm real estate was from 1925 to 1929 when slightly less than one-half of the total area purchased was obtained.

The average price contracted for all purchases on the clay and clay loam soils was \$25.55; for the silt loams and loams, \$19.60; and for the light loams and fine sandy loam, \$14.14. The demand for land increased as the early settlement progressed and low priced Crown land became scarce. War-time prices for wheat and flax, coupled with the high productivity of the virgin prairie

when weather favoured, brought about a steady rise in land values, and for the five-year period 1915 to 1919, the sale value of the clays and clay loam soils averaged \$28.28 per acre. The price of silt loams and loam soils remained relatively steady from 1915 to 1929, averaging approximately \$20 per acre for those 15 years, but in keeping with all other Saskatchewan lands, values have dropped sharply since that time.

The light loams and fine sandy loam soils were comparatively easy to bring under cultivation and they yielded quite satisfactorily in the pioneering days, consequently high prices were paid for acquisitions on this type of soil from 1910 to 1914—which averaged \$17.45 per acre. Between 1930 and 1934, the average price of these light soils was \$7.81 per acre, or 55 per cent of the average price paid since 1905. In the same period, parcels of land on the silt loams and loam soils were bought for prices averaging \$11.34 per acre, or 58 per cent of this long-time average price; and on the clay and clay loam soils for \$16.72 per acre or 65 per cent of the average price since 1905. The earliest payments were based on raw land, but much of the later purchases were of improved farms.

Saskatchewan farmers usually buy land on deferred payments, and in most cases, the initial cash payment is small. Twenty-six per cent of all the purchases recorded in the study were for cash, and 24 per cent were free from debt at the time of the study. Initial cash payments averaged 41 per cent of the contract price on parcels of land purchased on the clay and clay loam soils; 38 per cent for those on the light loam and fine sandy loam soils; and 38 per cent for those on the silt loam and loam soils. The operators on clay and clay loam soils made progressively larger initial payments on their purchases from the time of settlement until the period from 1920 to 1924, when an average of 54 per cent of the purchase price was paid. The farmers on the silt loam and loam soils paid about 38 per cent of the contract price at the time of purchase on acquisitions of land from 1920 to 1929, but during the preceding ten-year period, the proportion was rather less than one-quarter. On the light loam and fine sandy loam soils, the average initial payment on land bought from 1915 to 1919 was 48 per cent of the purchase price, and from 1920 to 1929, about 40 per cent. Since 1930, sales of lands have been difficult to make and very little cash has been necessary for initial payments on acquisition of land in this area as has been the case elsewhere in Western Canada.

The debt on land purchased on the clays and clay loam soils averaged \$16.09 per acre in 1935, which represents 66 per cent of the original price. On purchases made from 1905 until 1924, approximately \$13 per acre was still owing at the time of the survey. More recent purchases showed a higher debt. The parcels bought from 1925 to 1929 had an unpaid balance of \$19.34 per acre, which was equivalent to 75 per cent of the purchase price. The debt on all purchases made on silt loam and loam soils averaged \$13.70 per acre in 1935, representing 70 per cent of the original price. Acquisitions made between 1924 and 1930 were carrying \$15.87 per acre unpaid, or 77 per cent of the amount contracted. On purchases of light loam and fine sandy loam soils, there were approximately \$10 per acre still to be paid, or 71 per cent of the purchase price. Land acquired prior to 1920 had an average indebtedness of 36 per cent of the purchase price, contrasted with 79 per cent for acquisitions since that date. The corresponding figures on the silt loam and loam soils were 56 per cent and 75 per cent for the respective periods, and on the clays and clay loam soils, 51 and 69 per cent. Farmers on light loam and fine sandy loam soils made relatively greater progress in liquidating their real estate indebtedness on land acquired before 1920 than those operating on heavier soils. Subsequent purchases of land were more difficult to pay for on all classes of soil. Table 39 summarizes the data relating to the purchase price, the initial payment and the debt per acre on farm lands purchased by the owners included in this study.

In order to obtain a measure of the progress made by farmers in payment for farm lands subsequent to their purchase, the cash payment and the debt,

each as a percentage of the purchase price, were added together and this total subtracted from the purchase price (100 per cent). This calculation gave the percentage of the purchase price that had been paid over and above the initial payment at the time of purchase. This information is summarized in Table 40.

TABLE 39.—PROGRESS OF 689 FARM OWNERS IN PAYING FOR LAND PURCHASED ACCORDING TO SOIL AND DATE OF PURCHASE, SOUTHWEST CENTRAL SASKATCHEWAN, 1935

Date of purchase	Number of purchases	Purchase price per acre	Initial payment as percentage of purchase price	Debt in 1935 ⁽¹⁾	
				Debt per acre purchased	Debt as per cent of purchase price
<i>Clays and Clay Loams</i>					
		\$ cts.		\$ cts.	
1905-1909.....	1	1 56	100	13 44	.....
1910-1914.....	15	22 84	37	13 94	61
1915-1919.....	91	28 27	38	14 00	50
1920-1924.....	58	24 11	54	11 22	66
1925-1929.....	159	25 86	42	19 34	75
1930-1935.....	21	16 72	21	16 17	97
1905-1935.....	345	25 55	41	16 09	66
<i>Silt Loams and Loams</i>					
1905-1909.....					
1910-1914.....	7	16 03	21	4 41	28
1915-1919.....	57	20 77	25	12 16	59
1920-1924.....	41	19 00	37	10 88	57
1925-1929.....	112	20 72	38	15 87	77
1930-1935.....	15	11 34	2	13 71	121
1905-1935.....	232	19 60	32	13 70	70
<i>Light Loams and Fine Sandy Loam</i>					
1905-1909.....					
1910-1914.....	9	17 45	28	6 04	35
1915-1919.....	30	12 72	48	4 69	37
1920-1924.....	38	16 05	40	11 09	69
1925-1929.....	112	15 15	39	11 89	78
1930-1935.....	22	7 81	5	8 72	112
1905-1935.....	211	14 14	38	10 10	71

(¹) Includes unpaid interest accrued.

Previous to 1920, the owners included in the survey made 107 purchases on the clay and clay loam soils, 64 on the silt loam and loam soils, and 39 on the light loam and fine sandy loam soils. Lands on the clay and clay loam soils bought by those farmers from 1905 to 1919 had 11 per cent of the purchase price paid on them since making the initial cash payment. Operators on the silt loam and loam soils who purchased land in that period, paid 20 per cent of the purchase price in addition to the initial cash payment, and those on the light loam and fine sandy loam soils paid 22 per cent of the purchase price after the initial payment.

From 1920 to 1935, two hundred and thirty-eight parcels of land were purchased by the owners in the survey, on clay and clay loam soils; 168 on silt loam and loam soils; and 172 on light loam and fine sandy loam soils. During this period, no net progress was made. The amount of debt actually in-

TABLE 40.—PROGRESS OF 689 FARM OWNERS IN PAYING FOR LAND SINCE MAKING THE INITIAL PAYMENT AT THE DATE OF CONTRACT, ACCORDING TO SOIL CLASSES, SOUTHWEST CENTRAL SASKATCHEWAN, 1935

Soil	1905-1919		1920-1935	
	No. of purchases	Progress in paying for land since the initial payment. Percentage of purchase price	No. of purchases	Progress in paying for land since the initial payment. Percentage of purchase price
Clays and clay loams.....	107	11	238	— 9
Silt loams and loams.....	64	20	168	—11
Light loams and fine sandy loam.....	39	22	172	—15

creased by 9 per cent of the purchase price on the clay and clay loam soils; by 11 per cent on the silt loam and loam soils; and by 15 per cent on the light loam and fine sandy loam soils. Although the amounts owing increased, considerable payments were made on principal from the time of purchase until 1929, but such payments have been offset by the accumulation of unpaid interest since that date. By 1935, the accrued interest was greater than the previous payments made on principal in addition to the payment made at the time of purchase on each of the three soil groups. It should be kept in mind that no progress can be shown in paying for land until the interest on the amount outstanding has been met.

By way of comparison, it may be pointed out that in the Humboldt area of Saskatchewan, in which the most recent of the studies of farm indebtedness was made by the Department of Farm Management, University of Saskatchewan, in 1934 owners of farms on the loam soils had paid an average of 19 per cent of the purchase price in excess of the initial payment since the time of settlement. Farmers on sandy loam soils at Humboldt paid 16 per cent of the original price after making the initial payment. This area is outside the drought area and, therefore, has not experienced successive crop failures.

Reviewing the acquisition of land, the survey of 1935 indicated that farm owners included in this survey who made purchases of land on level to undulating topography and on clay and clay loam soils, paid somewhat higher prices than those who purchased land on more rolling topographies and on lighter textured soils. The debt in 1935 on parcels of land purchased from 1907 to 1935 was \$16 per acre on the clay and clay loam soils; \$13.70 on the silt loams and loams and \$10.10 per acre on the light loam and fine sandy loam soils. On parcels of land purchased from 1920 to 1935 by farm owners included in the survey, the debt increased on all soil types since the initial payment was made at the date of contract. The debt increased by 9 per cent of the purchase price on clay and clay loam soils, by 11 per cent on silt loams and loams and by 15 per cent of the purchase price on the light loam and fine sandy loam soils.

FARM INDEBTEDNESS

Two of the 836 farmers co-operating in this study were without debt in 1935. A few others had not found it necessary to contract debts until the year preceding the survey, and their debts were limited to the purchase of machinery, or for advances for seed grain. The average debt of the 836 farm operators was \$8,551. The average debt of 1,364 farm operators co-operating in farm indebtedness studies in four other areas ⁽¹⁰⁾ of Saskatchewan in 1932, 1933

¹⁰ The four areas are (1) Rosemount and Reford area, northwestern Saskatchewan within the prairie belt, (2) Humboldt, northeastern Saskatchewan within the park belt, (3) Qu'Appelle Valley areas, east central Saskatchewan, within the park belt, (4) Scott, Wellington and Brokenshell municipalities, southeastern Saskatchewan, within the prairie belt.

and 1934 was \$5,248 ⁽¹¹⁾ and of this number, 80 were without debts at the time the surveys were made. In all these studies, the debts reported relate to the operators only, and do not take into account any indebtedness of the landlords of those operators who rent part or all of the land which they farm.

Of those who own their farms and do not rent additional land, the average total debt per farm of 529 farm operators was \$9,697 for the area included in this study. This is approximately 59 per cent greater than the average total debt per farm of \$6,108 for the 849 farm operators in the other four areas of Saskatchewan. In this area, the debt per quarter-section is 50 per cent greater, and per acre of cropland slightly under 50 per cent greater, and per acre of cropland slightly under 50 per cent greater than the average of the four other areas.

TABLE 41.—TOTAL INDEBTEDNESS PER FARM, PER QUARTER-SECTION, PER ACRE, AND PER ACRE OF CROPLAND, FOR 836 FARMS IN SOUTHWEST CENTRAL SASKATCHEWAN, 1935, AND FOR 1,284 FARMS IN FOUR OTHER AREAS OF SASKATCHEWAN, 1932 TO 1934. DATA OBTAINED IN ECONOMIC SURVEYS AND ARRANGED BY CLASSES OF TENURE

	Owners		Part-owners		Tenants		All tenures	
	South-west central 1935	Four other areas 1932-1934	South-west central 1935	Four other areas 1932-1934	South-west central 1935	Four other areas 1932-1934	South-west central 1935	Four other areas 1932-1934
Number of farm operators.....	529	849	169	286	138	229	836	1,364
Number of farm operators with debt.....	527	798	169	276	138	210	834	1,284
	\$	\$	\$	\$	\$	\$	\$	\$
Debt per farm.....	9,697	6,108	10,012	5,943	2,368	1,192	8,551	5,248
Debt per quarter-section (operated)	3,086	1,990	2,126	1,475	869	415	2,522	1,620
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Debt per acre of all land.....	19 29	12 44	13 28	9 22	5 44	2 59	15 76	10 13
Debt per acre cropland.....	24 44	18 39	16 98	13 98	6 63	3 47	19 92	14 85
	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.	\$ cts.
Debt per acre owned land.....	19 29	12 44	22 43	15 66	.....	.....	19 98	13 62
Debt per acre owned cropland.....	24 44	18 39	28 80	22 81	.....	.....	25 40	20 08

Table 41 shows by classes of tenure, the average indebtedness per farm, per operator, per acre, and crop acre owned and operated for the area studied, and for the average of four other Saskatchewan areas in which studies of farm indebtedness had been made in the years immediately preceding.

Farm Indebtedness and Its Relation to Topography and Soil

In general, the debt per acre of cropland was greater for the operators on farms where the topography was less rolling and the soils heavier. For the owner operators, where the topography was level to undulating on the clays and clay loams, the average debt was \$29.90 per acre of cropland, compared with \$25.47 on the silt loams and loams, \$25.16 on the light loams and fine sandy loam. Though the debt per acre of cropland was less for the farms where the topography was gently to moderately rolling, a difference in the same direction in the amount of debt existed between the owner operators on the heavier and lighter soils. The

¹¹ Studies of Farm Indebtedness and Financial Progress of Saskatchewan farmers by Department of Farm Management, University of Saskatchewan, Reports Nos. 1, 2, 3 and 4, Agricultural Extension Bulletins Nos. 60, 65, 68 and 71, University of Saskatchewan.

difference in indebtedness per acre of cropland was not significant for the owners on farms with the three soil groups where the topography was strongly rolling to steep.

A statement of the total indebtedness per acre of cropland by topography and soil for 529 owner operators appears in Table 42.

The relationship of soils to farm indebtedness was similar to that generally found elsewhere in the province, although the difference in indebtedness of the operators on the heavier and lighter soils was less in this area. In the four areas recently included in economic studies representative of other parts of Saskatchewan and referred to in a preceding section (page) the debt per acre of cropland for the owner operators on clay soils was \$22.91; on loam soils \$17.46; and on a miscellaneous group of soils, somewhat inferior in productivity to the clay and loam soils, \$15.01.

TABLE 42.—TOTAL INDEBTEDNESS PER ACRE OF CROPLAND BY TOPOGRAPHY AND SOIL FOR 529 OWNER OPERATORS, SOUTHWEST CENTRAL SASKATCHEWAN, 1935

Topography and soil	Number of farms	Debt per farm	Debt per acre of cropland owned
		\$	\$ cts.
<i>Level to undulating—</i>			
Clays and clay loams.....	91	14,603	29 90
Silt loams and loams.....	44	10,225	25 47
Light loams and fine sandy loam.....	41	9,578	25 16
All soils.....	176	12,338	27 94
<i>Gently to moderately rolling—</i>			
Clays and clay loams.....	92	10,154	25 06
Silt loams and loams.....	91	9,793	22 95
Light loams and fine sandy loam.....	86	7,167	19 40
All soils.....	269	9,078	22 63
<i>Strongly rolling to steep—</i>			
Clay loams.....	28	6,378	22 88
Silt loams and loams.....	29	4,952	21 16
Light loams and fine sandy loam.....	27	7,189	21 80
All soils.....	84	6,146	21 30
All Farms.....	529	9,697	24 44

Indebtedness of Farm Operators Who do not Rent

For the 529 owners, the average total debt per acres of cropland was \$24.44 (Table 42). Approximately 30 per cent of these owner operators had an average debt of from twenty to thirty dollars per acre of cropland, while about two-thirds were included in groups ranging from ten to forty dollars per acre of cropland. Two owner operators had no debt, while six had a total debt exceeding seventy dollars per acre of cropland. The average size of these six farms measured in acres of cropland, was about 200 acres, which was much smaller than for the other groups.

The distribution of total indebtedness per acre of cropland for the 529 owners is shown in Table 43.

TABLE 43.—DISTRIBUTION OF 529 FARM OWNERS ACCORDING TO THEIR TOTAL INDEBTEDNESS PER ACRE OF CROPLAND, SOUTHWEST CENTRAL SASKATCHEWAN, 1935

Debt per acre of cropland	Number of owners included	Percentage of owners included	Cumulative percentage of owners
Nil.....	2	6.4	.....
Less than \$1.00.....	4	0.8	1.2
\$ 1.00—\$ 4.99.....	24	4.5	5.7
\$ 5.00—\$ 9.99.....	56	10.6	16.3
\$10.00—\$19.99.....	107	20.2	36.5
\$20.00—\$29.99.....	156	29.5	66.0
\$30.00—\$39.99.....	96	18.2	84.2
\$40.00—\$49.99.....	53	10.0	94.2
\$50.00—\$59.99.....	17	3.2	97.4
\$60.00—\$69.99.....	8	1.5	98.9
\$70.00 and over.....	6	1.1	100.0
Total.....	529	100.0	100.0

Classification of Farm Indebtedness

About 57 per cent of the total indebtedness of the owners and part-owners was associated with real estate in the form of agreements of sale and mortgages, and about 19 per cent with relief. Approximately 65 per cent of the total indebtedness of tenants was for relief. Taxes accounted for about 7 per cent of the debt for owners and part-owners, and implements a little less than this for these two groups of operators. Debts in connection with implements were second in importance to those for relief for the tenants.

The chief classes of debts, with the average per farm, and the percentage of the total for each class, for owners, part-owners, and tenants are shown in Table 44.

TABLE 44.—CLASSIFICATION OF FARM INDEBTEDNESS BY TENURE, SOUTHWEST CENTRAL SASKATCHEWAN, 1935

Class of debt	529 owners			169 part-owners			138 tenants		
	No. with item	Average all owners	Per cent of total	No. with item	Average all part-owners	Per cent of total	No. with item	Average all tenants	Per cent of total
		\$	%		\$	%		\$	%
Relief.....	523	1,815	18.7	168	2,080	20.8	138	1,529	64.6
Agreements of sale.....	310	2,162	22.3	67	2,274	22.7			
Mortgages.....	351	3,382	34.9	117	3,315	33.1			
Chattel mortgages.....	51	163	1.7	21	147	1.5	8	41	1.7
Implement.....	224	568	5.9	114	730	7.3	72	369	15.6
Gas and oil.....	140	80	0.8	55	89	0.9	19	37	1.6
Taxes.....	514	750	7.7	168	649	6.5	6	27	1.1
Lumber.....	154	92	0.9	48	62	0.6	10	6	0.3
Bank.....	138	198	2.1	52	219	2.2	17	62	2.6
Other.....	410	487	5.0	131	447	4.4	109	297	12.5
Total liabilities.....	527	9,697	100.0	169	10,012	100.0	138	2,368	100.0

In a similar study of indebtedness made in the Humboldt area in 1934, which included 409 owners and part-owners, 77 per cent of the total indebtedness was associated with real estate, and less than one-tenth of one per cent was for relief (12).

¹² Studies of Farm Indebtedness and Financial Progress of Saskatchewan Farmers by Department of Farm Management Report No. 4, Bulletin No. 71, Extension Department, University of Saskatchewan.

Mortgage Indebtedness

Mortgages on land are given as security to the creditors for existing obligations, or for the assumption of new obligations. Frequently, land is purchased by giving a mortgage on land already owned, or on land purchased on which a substantial payment has been made, or on both. In Western Canada, however, land is frequently purchased by means of agreement sale. In assuming a mortgage, a creditor may be expected to use a little more discrimination regarding the productivity of the land than would a person having land to dispose of by means of an agreement of sale.

In this area, there is little significant difference in the percentage of land indebtedness in mortgages for the three classes of topography, but farms on the heavier soils have the greatest percentage of land indebtedness secured by mortgages. Where the topography is level to undulating, 64.7 per cent of the land indebtedness is secured by mortgages for the clays and clay loams, while 49.5 per cent is thus secured for the light loams and fine sandy loam soils (Table 45).

Relief Indebtedness ⁽¹³⁾

Partial and complete crop failures resulting from drought during the six consecutive years from 1929 to 1934 have been a more important factor in the farm debt situation in this area than have the low prices for agricultural products. As pointed out previously in this report, about one-half of the farmers who provided statements in the survey of 1935 have had to depend on relief sources for part or the whole of their needs for six consecutive years. Only eight operators out of the 836 co-operating in this study had no relief indebtedness. The average relief debt per farm was \$1,829; per quarter-section, \$539; and per acre of cropland operated, \$4.26. For those who had no crop sales in 1934, the total relief indebtedness averaged \$4.42 per acre of cropland, which was about a dollar per acre of cropland more than those who had some crop sales.

Agricultural relief includes advances obtained to carry on farming operations, seed, feed, fuel, repairs and twine. From April 30, 1931, to April 30, 1935, the increase in the debt for these advances was less on the heavier than on the lighter soils, being \$1.88 per acre of cropland on the clays and clay loams compared with \$2.10 on the light loams and fine sandy loam. The debt increased \$4 or more per acre of cropland for agricultural relief from April 30, 1931, to April 30, 1935, for 7 per cent of the operators on the heavier soils, compared with 14 per cent on the lighter soils.

¹³ The data on relief indebtedness relate to the amount owing the municipalities and the Saskatchewan Relief Commission on April 30, 1935. The Welfare Relief Debt from April 30, 1931, to April 30, 1932, was cancelled, and is not included. Subsequent adjustments have not been dealt with in this report.

TABLE 45.—PERCENTAGE OF THE TOTAL LAND INDEBTEDNESS SECURED BY MORTGAGE FOR FARMS LOCATED ON EACH CLASS OF TOPOGRAPHY AND SOIL STATEMENT RELATING TO 698 FARMS⁽¹⁾, SOUTHWEST CENTRAL SASKATCHEWAN, 1935

Topography and soil	Number of farms	Percentage which mortgage indebtedness is of total land debt
<i>Level to undulating—</i>		
Clays and clay loams.....	118	64.7
Silt loams and loams.....	64	55.4
Light loams and fine sandy loam.....	52	49.5
All soils.....	234	60.2
<i>Gently to moderately rolling—</i>		
Clays and clay loams.....	132	64.8
Silt loams and loams.....	121	61.1
Light loams and fine sandy loam.....	115	58.9
All soils.....	368	62.1
<i>Strongly rolling to steep—</i>		
Clay loams.....	30	66.3
Silt loams and loams.....	37	34.2
Light loams and fine sandy loam.....	29	63.0
All soils.....	96	54.0
All Farms.....	698	60.6

(¹) Includes farms of owners who rent additional land (called part-owners in this study), but the statement refers only to the land which they own.

The distribution of increase in agricultural relief debt per acre of cropland from April 30, 1931, to April 30, 1935, by soil classes is shown in Table 46.

TABLE 46.—DISTRIBUTION OF FARMS ACCORDING TO THE INCREASES IN AGRICULTURAL RELIEF DEBT FROM APRIL 30, 1931 TO APRIL 30, 1935, PER ACRE OF CROPLAND, BY SOIL CLASSES, 836 FARM OPERATORS INCLUDED IN SOUTHWEST CENTRAL SASKATCHEWAN, 1935

Increase in agricultural relief debt per acre of cropland, 1931-1935	Per cent of farms		
	Clays and clay loams	Silt loams and loams	Light loams and fine sandy loam
Nil.....	2	.....	1
\$0.01-\$1.99.....	41	43	40
\$2.00-\$3.99.....	50	49	45
\$4.00-\$5.99.....	7	8	11
\$6.00 and over.....	.....	.....	3
Total.....	100	100	100
Number of farms.....	336	261	239
Average increase in agricultural relief debt per acre of cropland, 1931-1935.....	\$1.88	\$1.94	\$2.10

Relationship of the Size of Family and of the Farm to the Total Relief Debt

In order to determine the relationship of the size of the family which the farm had to support and of the size of the farm to the total relief debt of operator, the size of the family was calculated in "adult months" and the size of the farm in "acres of cropland." A member of the family 16 years of age or over living on the farm for one month was taken as equivalent to one adult month, if under 16 years, equivalent to one-half an adult month. Thus, an operator and his wife with one child ten years of age living on a farm for one year would be taken as equivalent to 30 adult months. If, in addition, there was another member of the family 20 years of age living with them for seven months, the total would be considered equivalent to 37 adult months. The total adult months from April 30, 1934, to April 30, 1935, was used as the measure of the size of the family and it was assumed that this was a relative measure of the number of persons which the farm had to support during the years advances for relief were obtained. In an area where wheat growing is decidedly the most important farm enterprise, acres of cropland is probably the most satisfactory measure of the size of the farm. Here again, it was assumed that the number of acres of cropland in the farm for the year April 30, 1934, to April 30, 1935, was a relative measure of the size of the farm during the years advances for relief were obtained.

The 836 farms were sorted into three groups according to the size of the farm and each group subsorted according to the size of the family into subclasses of 20 adult months. The relationship of the number of persons who had to be supported measured in adult months and the size of farm measured in acres of cropland to the total relief debt per farm is shown in Table 47.

TABLE 47.—RELATIONSHIP OF SIZE OF FAMILY AND SIZE OF FARM TO TOTAL RELIEF DEBT, 836 FARMS, SOUTHWEST CENTRAL SASKATCHEWAN, 1935

Size of farm acres of cropland	Adult months	Number of farms	Average adult months per farm ⁽¹⁾	Total relief debt per farm
				\$
0-299.....	0-19	43	12	942
	20-39	102	30	1,344
	40-59	94	47	1,583
	60-79	58	68	1,796
	80 and over	14	92	2,234
Average of group.....			43	1,485
300-499.....	0-19	29	13	1,148
	20-39	90	30	1,438
	40-59	102	47	1,939
	60-79	53	67	2,322
	80 and over	16	100	3,020
Average of group.....			45	1,834
500 and over.....	0-19	8	13	1,688
	20-39	45	32	1,945
	40-59	75	49	1,885
	60-69	69	66	2,629
	80 and over	38	93	2,923
Average of group.....			57	2,276
Average of all farms.....			47	1,829

⁽¹⁾ Member of family 16 years and over at home for one month—one adult month; under 16 years—one-half adult month.

The larger farms usually had the greatest relief debt. They also had the greatest number of persons to support. The average relief debt of the group of

farms having 500 acres of cropland and over was approximately 51 per cent greater than the average of the group of farms less than 300 acres of cropland in size, the average debt per farm for the two-size groups of farms being \$2,276 and \$1,485 respectively. For the group of farms 50 acres and over, the average number of adult months per farm was 57, which was approximately 33 per cent greater than the average of the group of farms less than 300 acres in size. Within each of the three groups of farms, the average relief debt per farm became greater as the number of persons supported increased, and the farms having the greatest number to support had more than twice the relief debt of those having the least number. Both the size of farm, and the number of persons to be supported, were contributing factors to the extent of the relief debt, but of these two, the number of persons which the farms have had to support appears to have been the more important.

Concerning farm indebtedness in this area then, the survey of 1935 showed that of the 836 farm operators, only two were without debt and the average indebtedness per farm operator was \$8,551. For 529 farm owners, the debt per farm and per acre of cropland was somewhat higher where the topography was level to undulating; the same was true for the farm owners on heavier soils except where the topography was strongly rolling to steep. Approximately 57 per cent of the total indebtedness of owners and owner-tenants was associated with real estate in the form of agreements of sale and mortgages; of the farms on the heavier soils compared with those on lighter soils a larger percentage was in mortgages. Relief debt accounted for 19 per cent of the total indebtedness of the owners and owner-tenants and 65 per cent of the total indebtedness of the tenants. The increase in relief debt on account of advances to carry on farming operations from 1931 to 1935 was slightly less on the heavier soils than on the lighter soils per acre of cropland. Both size of farm measured in cropland and the number of persons to be supported were contributing factors to the extent of the relief debt, but of these two, the number of persons which the farms have had to support appears to have been the more important.

Group of farms	Number of farms	Number of persons supported	Number of adult months	Debt per farm	Debt per acre of cropland
Less than 50 acres	100	100	100	100	100
50 to 299 acres	100	100	100	100	100
300 to 499 acres	100	100	100	100	100
500 acres and over	100	100	100	100	100
Total	400	400	400	400	400
Less than 50 acres	100	100	100	100	100
50 to 299 acres	100	100	100	100	100
300 to 499 acres	100	100	100	100	100
500 acres and over	100	100	100	100	100
Total	400	400	400	400	400
Less than 50 acres	100	100	100	100	100
50 to 299 acres	100	100	100	100	100
300 to 499 acres	100	100	100	100	100
500 acres and over	100	100	100	100	100
Total	400	400	400	400	400

The larger farms usually had the greatest relief debt. They also had the greatest number of persons to support. The average relief debt of the group of farms having 500 acres of cropland and over was approximately 51 per cent greater than the average of the group of farms less than 300 acres of cropland in size, the average debt per farm for the two-size groups of farms being \$2,276 and \$1,485 respectively.